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Development of Emotions and Emotion Regulation

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This book is dedicated to Dorothee Seeger
The reader of this book is about to encounter a rare intellectual treat. Once every 20 to 25 years, a work appears on the scene that simultaneously integrates a field of knowledge and markedly advances that field. Two decades ago, such a book was Nico Frijda’s masterpiece, *The emotions* (1986), which was both a superlative though selective review of the literature on emotion, and a powerful, original, integrative theoretical statement about the nature of emotion. Frijda’s was a book that could be used either as a textbook on emotion, or as a theoretical treatise, and succeeded however one chose to use it.

In this book, Holodynski and Friedlmeier have created a contribution that I find similar to Frijda’s. It presents both a successful overview of the emotional life of the baby and child, as well as a bold and fascinating explanation of emotional development. The authors’ explanation is set into context by a sympathetic and thorough summary of the major metatheoretical approaches to emotional development. This summary is notable both for the cogency with which it deals with each major metatheory, and by the accurate assessment of the strengths and weaknesses of each approach. In reviewing the metatheories, the authors set the stage in a gracious and scholarly manner for their own approach, the originality of which comes through all the more clearly by their *mise-en-scène*.

In treating existing approaches to emotional development, the authors reveal their commitment to an understanding of emotion as relational, as processes that necessarily involve both the person and the physical and social environment as two poles of a single field. In so doing, the authors reject the traditional intrapersonal and intrapsychic view of emotion and feeling. Their relational emphasis also lays the basis for one of the major theoretical innovations the authors propose (the caregiver’s shaping through mimicry and exaggeration of the infant’s expressions).
Holodynski and Friedlmeier also view emotions as functional, as crucial for the satisfaction of a person’s strivings and goals. They argue convincingly against the existence of structural expressive wholes (e.g., facial prototypes) as universals that are biological givens, such as has been often proposed in research based on the universality of recognition of facial and vocal expressions of emotion in actor-posed pictures. Instead, the authors stress the equipotentiality of emotional responding instead of its supposed reflexive inflexibility.

The functional emphasis leads to a very different role for the concept of affect feeling states than is typically proposed in contemporary theory. Feelings are not the origins of emotional behavior, but instead, are conceptualized as regulatory signals that modulate, intensify, or shift the quality of behaviors. The authors, in short, view emotions as intimately tied to feelings as regulators of behavior. Here too, in contrast to orthodox approaches, Holodynski and Friedlmeir’s proposals neither make feelings the origins of emotional behavior, nor do they ignore feelings; to reiterate, for them, feeling states serve as signals guiding actions.

These basic assumptions of Holodynski and Friedlmeier’s theory lead to some very startling predictions and some extraordinary heuristic propositions. Consider how the authors ground the origins of emotional development in biologically-given proto-expressions or partial expressions, rather than the fully formed expressive patterns predicted by Differential Emotions Theory (Izard, 1991). These proto-expressions constitute the raw materials that are molded into potentially rather different culturally-mediated patterns. This molding is accomplished through the intermediary of the caregiver’s exaggerated pattern of mirroring or mimicking of the infant’s expression, followed by subtle shifting into the expression patterns expectable in that culture. By proposing that cultural agents, and not only biology, shape emotional expressions into patterns, the authors are instantiating how emotions are relational and functional. The authors also use this line of thought to document how expressions and feelings are ultimately interrelated.

For Holodynski and Friedlmeier, feelings are intimately tied to bodily sensations and feedback—a view that at first sounds like a revival of the James-Lange theory of emotion, brought down to the level of the infant and child. However, theirs is not an orthodox feedback theory. They borrow from Damasio’s (1994) view that over time circuits that originally depended upon sensations from the periphery of the body can become “short-circuited” into purely intracerebral processes that no longer require skeletal, autonomic, or endocrine-mediated feedback. This “short-circuiting” view of feeling results in one of the most daring and provocative heuristic implications of Holodynski and Friedlmeier’s book—that interiorization of emotional expressions that earlier were exclusively externally manifested become minimized into unseen implicit actions at about 5–7 years of age. This interiorization constitutes a major component of mature emotion regulation. Once the interiorization takes place, emotion regulation permits higher levels of voluntary self-regulation. That is, the child can manipulate emotions as mental
objects, and the child can also more readily coordinate one interiorized emotion with another. Such coordination can lead to inhibition of one emotion, sequencing of two or more emotions, blending of emotions into novel combinations, or re-structuring outward behaviors to produce more desirable outcomes. The authors’ predictions about interiorization are both bold and refreshing. Few ideas in the contemporary literature on emotion regulation are so original, or so relevant for understanding how emotions become so flexibly manifested.

The authors do not propose that the child jumps from non-interiorized fully-embodied emotional manifestations to fully interiorized and unobservable expressions without intermediary steps. Consistent with their emphasis on experience and shaping, the authors propose a fascinating bridging process. That process is the symbolization of emotions. The gap between the fully-expressed emotion and the interiorized one is filled by a step in which portions of the emotional expression are used as gestural signs. For instance, a scowl is not an inevitable predictor of a fully-embodied act of hostility. The sign is an indication of the arousal of incipient hostility. However, the sign is more rudimentary than an interiorized expression because it does not allow for the flexibility of action that is possible with full symbolic interiorization (such flexibility would include conciliation, resignation, or outright hostility as possible outcomes). The sign is a more limited and intermediate step between thoroughly overt action and unobservable interiorized expression.

The culmination of these ideas is represented in the chapter on emotion and culture. There, the theory is recapitulated, some empirical work in support of the theory is presented, important studies on culture and emotion are described, and significant directions for future research are articulated.

The book, like the study of emotional development, is a work in progress. There are many lacunae in the arguments the authors present; many of the propositions made in the narrative are quite controversial and doubtless in need of modification. Moreover, while the book may be an intellectual treat, it is not an easily assimilated treat. The reader must work to follow the arguments presented within the book. Nevertheless, unlike many treatises on emotion, this book has no dull moments. The reader is edified at every page, and made to think differently about emotional development than he or she has done so before. Creative ideas, exciting writing, and challenging thoughts—what more can a reader ask for in a scholarly contribution?

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PREFACE

It was 13 years ago that we met for the first time at a German developmental psychology conference. One of us, Wolfgang Friedlmeier (WF), was interested in ontogenetic development from a cross-cultural perspective. He presented a study on the development of empathy and distress in preschool age, dealing with how far children from different cultures respond to comparable demands with different emotions and regulation strategies. The other, Manfred Holodynski (MH), was interested in ontogenetic development from the perspective of internalization: How processes that are originally socially distributed between persons are transformed into mental processes within the individual. He presented a study on the development of the emotions pride and shame in preschool age.

This led the two of us to discover our common interest in central issues of emotional development: What role do the emotions play in an individual’s activity regulation? What is it exactly that is “developing” when we talk about emotional development? Do emotions have a social genesis? And what is the role of the early social interactions between children and their caregivers, along with the obvious fact that individuals grow up and live in completely different cultures? Even at this time, we both already suspected that the social and cultural embedment of the individual would prove to be a key to understanding how the diversity of human emotions and their regulation develop.

Together, we also realized that—in contrast to other functional domains of development—there was no specific book addressing emotional development across the life span. Researchers analyzing the emotions of adults seemed to have little interest in developmental issues, whereas developmental psychologists all seemed to be interested in only narrow age ranges.
We took one step toward filling this gap when Spektrum publishers at Heidelberg brought out our edited German-language book, *Emotionale Entwicklung. Funktion, Regulation und soziokultureller Kontext von Emotionen* [Emotional development: The function, regulation, and sociocultural context of emotions] in 1999. While trying to publish the findings collected in this book in English as well, we both realized that it would be a good idea to write our own book in English. We wanted to place our work in developmental and emotion psychology on a sound theoretical basis and formulate a general developmental theory of the emotions from birth to adulthood that could also explain how emotions are tied to other psychological regulation processes and how they are embedded within the sociocultural context.

Our optimistic hopes that we would be able to integrate our research findings and turn them into a book relatively quickly were soon dashed. The project developed a life of its own, and work on the book proved to be far more difficult and time-consuming than expected. Our attempt to construct a consistent theoretical framework to analyze emotional development called for several stages: (1) analyzing the existing theoretical traditions in emotion research (MH); (2) formulating an internalization model of emotion (MH); (3) producing a more precise formulation of the idea already presented in MH’s postdoctoral dissertation (*Habilitation*) that emotional expression should be conceived as a communicative sign, and plotting its acquisition and internalization during the ontogenesis of emotions (MH); working out the relation between emotion regulation and emotional development (MH/WF); and (4) plotting the role of the cultural context (WF/MH). Because children adopt and internalize culturally shaped expression signs and regulation strategies with their culture-specific meanings, they also develop culture-specific emotions and patterns of regulation.

The key assumption in the internalization model presented here is that the emotional expression signs and regulation strategies found in the interactions between caregivers and children take on a major communicative function in human emotional development. Expression signs are the major means of communication by which children and caregivers convey their emotions—particularly in early ontogenesis. Regulation strategies (by caregivers) play a major role in determining how well emotions can become integrated into individual and social activity regulation. These expression signs and regulation strategies are also the product of culture-historical symbol formation processes.

We are very aware that we have been unable to realize all our ambitions. We have not been able to treat all the aspects of this topic, and we have not been able to give full credit to the enormous quantity of published work. However, the guiding line throughout this book is to present the basic outline of the internalization model, to lay bare its theoretical premises, and to consider studies that either
provide empirical support for the model or contradict it. This approach also led us
to several speculations that still require empirical confirmation. We hope that our
readers will find the development model presented here both understandable and
interesting, that it will enjoy some support but also trigger criticism, and, above
all, that it will encourage further empirical research.

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Wolfgang Friedlmeier, Allendale, Michigan, USA
This book would never have been possible without the help and support of many colleagues. Our first thanks go to Dorothee Seeger. She has been involved in this work both critically and supportively right from the very start. Her critical feedback led to the rejection of many a passage in the text and its full revision. This was a great help in clarifying our ideas as well as our writing style.

The second person we have to thank is Jonathan Harrow. He has translated our manuscript from German into English with painstaking care and precision. We sat together repeatedly trying to tease out the most appropriate translation. Ambiguities and difficulties here also led to changes in order to express some of our ideas more clearly and more simply.

We also thank Joseph Campos for his encouraging support. His enthusiasm for the book project was a great reassurance, particularly during those phases when we were beginning to doubt whether we would ever be able to bring it to a successful close.

Furthermore, we thank Bettina Janke as well as the members of the research group on “Emotions as Bio-Cultural Processes” at the Center for Interdisciplinary Research, Bielefeld, for their useful suggestions and comments. Our thanks also go to Elisabeth Wolter and Sabine Peglow for carefully going through and correcting our references and literature list and preparing the index. Last but not least, we thank Sharon Panulla and Anne Meagher at Springer (formely Kluwer) for their friendly response to all our queries and her patient acceptance of repeatedly postponed deadlines.
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Chapter 1

INTRODUCTION

How can we describe and explain how emotions develop in human beings? Although this may seem a simple question, a very complex and broad approach is needed to gain a scientific answer. Put briefly, it is necessary to compare the emotional processes of the infant with those of the adult, describe how they differ and what they have in common, formulate a theory explaining how modifications arise and continuity is maintained as human beings grow from infancy to adulthood, and then finally support the theoretical postulates through empirical research.

1.1. PERSPECTIVES ON EMOTIONAL DEVELOPMENT

A first look at emotional development. Anyone who has a lot to do with children knows only too well how directly and vigorously they live out their emotions. One characteristic feature is particularly conspicuous: Young children experience their emotions as being beyond direct, voluntary control—as something that involves their entire being and demands to be expressed. This is equally true for both positive emotions such as joy, pride, or affection and negative emotions such as anger, worry, or fear. Just as children can be completely overwhelmed by joy at a new discovery, something unfamiliar can be so frightening that parents have to intervene to dispel their fears.

It is not just children who experience strong emotions. Sometimes, even adults are overwhelmed by joy, lose their self-control when angry, or panic when frightened. Nonetheless, there is one clear difference: As a rule, these emotions are neither as frequent nor as intensive as they are in children. As Brown and Kozak (1998, p. 150) express it:
It is widely accepted that when development, in general, goes well, both the frequency and the intensity of emotional reactions decrease. If, as is the case in certain personality disorders, an individual reaches adulthood without achieving the expected diminution in the frequency and intensity of emotional reactions, he or she is considered maladapted or sick. For the parent, teacher, friend, or clinician who has to deal with people having the emotional constitution of a 3-year-old and the executive powers of an adult, the experience can be overwhelming.

One could interpret this quantitative diminution in the frequency and intensity of emotions as a sign that they become less important with increasing age. However, this diminishing importance is contradicted by the observation that adults and older children experience other emotions not yet encountered by infants, such as sympathy, guilt, pride, or humility. Hence, the general diminution in the frequency and intensity of emotions as a function of growing age is accompanied by the emergence of new emotion qualities (see also Malatesta, 1981a). How can we explain this apparent contradiction? What causes it? Research taking the perspective described above focuses on the qualities of single emotions.

A second look at emotional development. A closer inspection of emotional episodes in adults and children reveals two further differences.

First, adults experience fewer and weaker emotions because they take precautions and make plans to protect themselves from being overwhelmed by intensive negative emotions. They try to direct their actions toward voluntarily set goals; they apply their (conscious) knowledge and skills to select potentially successful paths toward their goals; and they anticipate possible emotional reactions. This growth in action planning makes positive emotions fewer and weaker. Predictably planned successes do not trigger such intensive positive emotions as unanticipated ones. Hence, one fundamental change during ontogenesis is in the form of daily activity regulation. Infants’ actions are still guided almost exclusively by their emotions. As they get older, they start to learn how not to just give in to their emotions but also to regulate them in order to attain a specific goal. Within this developmental process, the self-system emerges as a regulating agent.

Second, adults do not impart their emotions to external observers as much as children do. Whereas the facial expressions of younger children convey their emotions like an open book, adults possess a private emotional sphere that cannot always be read off from their expressive behavior. Hence, ontogenesis seems to produce—at least in western cultures—a dissociation between emotional expression and emotional feeling. Malatesta and Haviland (1985) talk about a “desomatization” of the emotions. This leads to the question whether adults “suppress” the authentic expression of their feelings, as the concept of display rules would suggest (see Ekman, 1972), or whether the emergence of this increasingly private emotional sphere is a product of other developmental mechanisms related to the increasing use of signs (e.g., in the form of speech signs and expression signs) and the emergence of a mental level of expression, speech, and action.
Hence, a second look at emotional development raises new questions: How far does the role of emotions change in the individual regulation of activity? How do children learn to regulate their emotions? Is there such a thing as a desomatization of emotions, and how does this develop? In contrast to the first look at emotional development, these questions no longer focus exclusively on single qualities of emotions, but on the ways in which emotions are integrated into individual activity, and how this integration develops in qualitative and quantitative terms during ontogenesis. Research taking this perspective focuses on the role of emotions within the system for regulating activity.

A third look at emotional development. The developmental trends from infancy to adulthood sketched above have one further special quality: Individual development takes place within a culture-historical context. A species-specific human characteristic is to shape one’s environment to meet one’s own purposes and needs. This is a cooperative venture in which culturally created artifacts in the form of tools and signs are used and passed on to the next generation through the formation of cultural traditions. The next generation can then adopt these cultural artifacts and their meanings and use them to regulate their own activities (Cole, 1996; Tomasello, 1994; Tomasello, Kruger, & Ratner, 1993).

Although the animal world reveals species-specific adaptations to ecological systems, animals are limited in their ability to adapt their behavior individually and actively redesign their environment (Lorenz, 1977).

Cultures differ in terms of their historically developed worldviews, social practices, and forms of interpersonal relationships. They also differ in terms of which accompanying emotional reactions are passed on to the next generation within the process of socialization. By communicating culture-specific patterns of meaning, caregivers cannot determine the child’s developmental options, but they do channel them. When considering the cultural context, it is possible to ascertain two further trends.

First, one can conceive each individual as a self-developing system that pursues its own path of development within the specific cultural context. Two neonates are still comparatively similar in the emotional regulation of their behavior—there are still only a few psychological parameters on which they may differ. As ontogenesis proceeds, their emotional action regulation will start to differ increasingly as a function of how far their interactions with their own specific culture-historical context differ: What makes them anxious or pleased, how far they react with anger rather than shame, how they regulate their emotions, how much attention they pay to their private emotional spheres, and so forth. In summary, a person’s emotional development becomes individualized during ontogenesis.

Second, emotional development proceeds within a cultural context, with the consequence that emotions and their regulation are also linked to the interpretations and evaluations attributed to events acquired over the course of development. Here, it is necessary to determine how far universal characteristics can be ascertained
because of the common biological foundation of all human beings and because of the universal nature of many demands and life events (e.g., loss of a much-loved person).

The effects of culture on emotional development are mediated decisively by the self-system that each individual builds up. Markus and Kitayama (1991) distinguish an independent from an interdependent self-concept: In the former, one sees oneself as a unique personality independent from the social context, and one defines oneself predominantly in terms of internal characteristics or traits. In the latter, one sees oneself as being closely related to important others who are thereby viewed as part of one’s self, and one defines oneself through features of the situational context. There is a very strong culture-specific variation in these different concepts, and one outcome of this may be the attribution of different meanings to emotional reactions. For a person with an independent self-concept, emotions that promote independence (e.g., happiness or pride) or defend it (e.g., anger or frustration) are viewed as “natural,” “good,” and “correct.” In contrast, for a person with an interdependent self-concept, such values are attributed to emotions that promote and maintain attachment (e.g., sympathy or modesty) or defend it (e.g., shame or separation anxiety; see Kitayama & Markus, 1994).

The third look at emotional development raises further questions: How can we conceptualize the process of individualization in the culture-historical context? Does emotional development follow a biological schedule, or does it proceed through interaction with the sociocultural context according to a cultural one? Do culture-specific emotions and forms of regulation really exist, or are these only “negligible” deviations in what is otherwise the same emotional apparatus for all of us?

Whereas, in our first look, emotional development seems to focus solely on single emotions, the second look extends the perspective to include the analysis of emotions within the system of activity regulation, and the third look examines this system of activity regulation within the culture-historical context along with the consequences this context has for emotional development.

1.2. A PRELIMINARY SUMMARY

As this introduction shows, there is a wealth of different phenomena and unresolved issues in our understanding of the development of human emotions. Hence, formulating a theory of emotional development that takes into account and explains all these phenomena and their emergence during ontogenesis would seem to be an impossible venture. Accordingly, it is not very surprising that research over the last 20 years has taken a “reductionist” approach. For example, most emotion theories formulated during this period analyze only partial aspects of the above-mentioned variety of phenomena such as the sequence in which individual
types of emotion emerge or the development of emotion regulation. Or they focus on developmental phenomena in narrowly defined age ranges, predominantly infancy. Theories on the emotions in developmental psychology hardly ever look at emotions in adults (see, however, e.g., Carstensen & Charles, 1998; Magai & McFadden, 1996), and most research on emotions in general psychology does not address the origins of emotional phenomena.

The different reductions of the phenomenal field by the individual theories also lead to strong variations in, and even contradictions between, the definitions of emotions. Each theory has its own definition (see Goller, 1992; Kleinginna & Kleinginna, 1981; Mascolo & Griffin, 1998b), and there is no consensus on necessary and sufficient criteria for defining what constitutes an emotion. Terms that are fundamental in one theory are viewed as derivations in another and vice versa. For example, facial expression is something fundamental for emotions in Izard’s differential emotions theory (Izard, 1977), whereas it is something learned and therefore derived in Lewis and Michalson’s emotion theory (Lewis & Michalson, 1985). Hence, it is not surprising that research on emotion in developmental psychology over the last 20 years tends to resemble an uncoordinated patchwork made up of a variety of different theoretical patterns. Although this has generated a number of interesting individual empirical findings, it has not produced any conclusive and homogeneous account of human emotional development from infancy to adulthood.

One reason for this is certainly the lack of a unifying paradigm for the psychology of emotions to equal that of phylogenetic evolution in biology. This could provide a common conceptual framework for the individual studies in the scientific community. Even though such a unifying paradigm has yet to emerge, two general criteria can be formulated for a theory on human emotional development.

A developmental theory has to cover the entire time period during which human beings exhibit a potential for development. Emotions have to be examined across the entire life span from birth to adulthood. Strictly speaking, one should also include development until death, that is, into old age (see Magai & McFadden, 1996).

A developmental theory has to describe the systemic structure of emotions at different ages. How does a given psychological structure channel an emotional process at a certain age? It also has to explain how psychological structures emerge and change—and thus describe processes. How does a given structure of emotions and actions at a certain stage of ontogenesis develop from earlier structures?

Basically, it is possible to take two diverging perspectives on development: The first assumes that the psychological structure may change, at best, quantitatively, but not qualitatively, during ontogenesis. Psychologically speaking, this would mean that the neonate is already a “little” adult. Such a stance can be traced in most emotion theories taking an evolutionary direction and assuming a biologically predetermined set of basic emotions (e.g., Ekman, 1992). Emotional
development is then restricted to the time schedule by which the single basic emotions first appear and to the quantitative changes in, for example, their frequency, intensity, and controllability.

The second perspective assumes that emotional reactions differ so much between infants and adults that one has to posit qualitative changes in psychological structure. Dynamic system theories (see Dickson, Fogel, & Messinger, 1998; Lewis, 1995) or contextualist theories (see Campos, Kermeoian, & Witherington, 1996; Sroufe, 1996) take this perspective. Both perspectives need to be taken into account in an integrative approach.

1.3. THE DESIGN OF THIS BOOK

The idea guiding this book is to formulate a theory that embeds the development of emotions and their regulation within their social and cultural context. This theory should be able to describe the major phases of their development from infancy to adulthood along with the underlying developmental mechanisms. Such a goal results in the following design of the book.

Chapter 2. This chapter starts by asking which aspects of an emotion are in any way accessible to change during development. This requires a sketch of the range of phenomena which an integrative theory has to describe and explain. The wide range of theories in research on emotions can then be assessed in terms of these aspects in order to ascertain their potential contribution to an integrative theory. Based on their underlying assumptions, these theories can be summarized into four different paradigmatic families: structuralist, functionalist, dynamic system, and sociocultural (see also Mascolo & Griffin, 1998b). We sketch basic assumptions in each of these families of theories, report major empirical findings, and discuss potential problems and unresolved issues. It can be seen that different theoretical approaches examine the dimensions of development in varying detail. This makes their integration seem worthwhile so that we can relate the developmental phases of the emotion systems to the other subsystems of individual activity regulation over the entire range of development from infancy to adulthood.

Chapter 3. Examining earlier approaches leads us to ask what such an integrative approach might look like. Chapter 3 sketches our proposed model. The first outcome of our discussion on the emotion paradigms in Chapter 2 is to develop a definition of emotion as the basis for our model. This definition views an emotion as a dynamic psychological system embedded within the individual’s activity regulation as a whole. The function of an emotion is to regulate the motive-relevant aspects of actions. It is made up of four components: appraisal, expression, body regulation, and feeling. We conceive their functional interrelations in the form of a modified feedback model. Put more precisely, we define an emotion as a self-organizing mental system that (1) appraises the significance of internal or external
context-embedded causes in terms of the satisfaction of own motives, and (2) trig-
ggers adaptive expression and body reactions that (3) are perceived subjectively as
a feeling through body feedback and related to its cause, so that (4) motive-serving
actions are (or can be) triggered either by the person himself or herself or by an
interaction partner. For example, when a young boy experiences the emotion pride,
the motive-relevant appraisal consists in the attainment of a normative standard
through his own action; it expresses itself in self-enhancing expressions (e.g., erect
posture, impulse to present oneself to others) and body reactions (e.g., body ten-
sion); and the resulting feedback provides the subjective somatic marker (Damasio,
1994) for the subjective feeling of pride and is directed toward its cause (e.g., a
successful exam), triggering actions that will help this feeling of pride to persist.

We consider that a second outcome of the discussion on emotion paradigms is
to see that one can distinguish between an initial state in ontogenetic development
in which the feeling system processes real feedback from the motor and body
regulation system and an advanced state in which the feeling system is also able
to process purely mental representations of this feedback. One central assumption
in our model is that the mental processing of body feedback emerges during onto-
genesis through an internalization of motor and body-regulating processes. This is
why we call it an internalization model. We see similarities to Damasio’s concept
of “as-if feelings” (Damasio, 1994), Church’s (1982) idea of emotions as internal-
ized actions and Malatesta and Haviland’s idea of a desomatization of emotions
during the human life course (Malatesta & Haviland, 1985). We believe that our
internalization model is able to integrate a number of previously contradictory
findings and theories on the emotions of adults by conceiving the characteristics
of emotions in adults in terms of a development-related analysis of their genesis
during the human life course.

Certain developmental preconditions have to be met before a desomatization
of emotions can occur: We believe the most important of these to be that human
beings create cultural artifacts that do not just consist of tools and speech signs but
also expression signs. We assume that expression signs are as important for emo-
tional development as speech signs are for cognitive development. This provides
us with a novel approach to how emotions are shaped by cultural processes, and
how culturally universal and culture-specific emotions may emerge.

A third outcome of the discussion on emotion paradigms is our conclusion
that emotions represent only one of several levels of regulation in human activity.
This makes it important to consider how the emotional level of action regulation is
embedded within human activity regulation as a whole, and which repercussions
this embedment has, in turn, for emotional action regulation. We propose four
levels of regulation that are sketched at the end of Chapter 3.

Chapter 4. This is where we describe the ontogenesis of the emotions and
emotion regulation. First, we present the ontogenetic starting level: We report on
innate psychological competencies and consider how babies and their caregivers
are preadapted to each other. Then, we concentrate on the prototypical course of development, giving only marginal consideration to interindividual differences. For each single ontogenetic phase, we name the tasks that children have to master in their emotional development, and we describe the mechanisms that drive forward the development of emotions and their regulation in the process of interaction between children and their social partners. In its current state of elaboration, our model assumes five developmental phases.

In the first developmental phase leading through babyhood and infancy, sign-mediated levels of regulation emerge. During this phase of interpersonal regulation with their caregivers, children have to master the task of building up a differentiated repertoire of emotions mediated by expression signs and acquiring a repertoire of motive-serving actions. Our hypothesis is that the expression signs in the interaction between child and caregiver are a major variable influencing the emotion qualities that emerge: Caregivers interpret the still undirected infant expression and body reactions against a background of culturally shaped patterns of perception and interpretation; they mirror them in their own expression in the form of prototypical expression signs; and they react promptly with motive-serving coping actions. This is the way in which infant precursor emotions are differentiated and transformed into fully functioning motive-serving emotion systems. For example, the distress cries of the newborn (which are triggered by physical stimulus properties, are undirected, and take time to build up) become the anger emotion of the infant (which is induced by the subjective, motive-relevant significance of a cause, is directed toward that cause, and contains a prompt, well-organized expression reaction).

In the second developmental phase during toddlerhood and preschool age, intrapersonal levels of regulation emerge. Initially, ontogenesis is dominated by interpersonal levels of regulation: It is caregivers who interpret the expression reactions of their babies and carry out the required motive-serving actions, be they feeding, diaper changing, calming, stimulating, or whatever. We describe how children become increasingly able to carry out motive-serving actions by themselves without social support and to coordinate their personal motive satisfaction with both the social environment and the situational demands, in other words, to build up an intrapersonal level of regulation. The emergence of self-evaluative emotions such as pride, shame, and guilt along with the emergence of symbolically mediated strategies of emotion regulation take on a major role here. We shall also report our own studies in this field.

The third developmental phase starting around the sixth year of life sees the onset of the internalization of psychological means of regulation as described above. A mental level of expression, speech, and action emerges. This permits subjective feelings that may no longer be based on any body feedback from real expression and body reactions, but on their mental representations. We shall report on a number of studies that we have carried out in this field as well.
As we have not done any research or extended our model to cover adolescence, we have to leave out this fourth phase of development. Nonetheless, we assume that adolescents make further advances in the development of emotions and emotion regulation. We suspect that the developmental tasks during adolescence are learning to extend one’s previously acquired competencies in self-regulation to the distant future. That means to evaluate one’s actions in the here and now in terms of their consequences for future motive satisfaction and the future of one’s social community (and, eventually, the environment as well), and to be able to reach appropriate decisions. This characterizes the typical activity regulation of the conscientious adults who form the “pillars” of a society. The development during adulthood covers the fifth developmental phase.

Chapter 5. In this chapter, we broaden our perspective to cover how the development of emotions and emotion regulation are embedded within the cultural context, and how culturally universal aspects can be distinguished from culture-specific ones. Whereas our presentation of emotional development in ontogenesis refers exclusively to western culture, this chapter focuses on the role of culture itself. It draws on existing theoretical conceptions and empirical findings to work out how culture impacts on individual emotional development. Emotional characteristics are also examined in terms of their universality or cultural relativity.
Chapter 2

RESEARCH PARADIGMS ON EMOTION

Everybody knows what an emotion is, until asked to give a definition
Fehr & Russell, 1984, p. 464

When trying to mark out the boundaries of phenomena covered by emotional development, we have to answer the question raised by Mascolo and Griffin (1998b) in the title of their book: What develops in emotional development? Despite all the differences in the existing theoretical approaches, there seems to be a general consensus that emotions possess two aspects: a form and a function. The form aspect focuses on which indicators can be used to identify an emotion. The function aspect focuses on which (adaptive) functions emotions serve for human activity in interaction with other functions such as perception, memory, or motivation. Furthermore, there should also be a general consensus that human development from birth onward is characterized by an interplay between nature and nurture, and is always embedded within a context that, unlike the natural context of animals, is a product of culture. Hence, we can define the following five dimensions of emotional development.

The quality of an emotion. It is clear that new kinds of emotions form during the course of human development. Adults have a number of emotions at their disposal that are not yet available to the infant. In Lazarus’ list of emotions, these are shame, guilt, jealousy, envy, pride, relief, hope, and sympathy (Lazarus, 1991). These emotions first form during infancy and preschool age. Sroufe (1996) even goes so far as to assume that other emotions such as anger, fear, sadness, joy, and love also evolve only during the first year of life from initially unfocused “precursor emotions.” A central issue is then which specific features characterize
the quality of a specific emotion. Are these features based on a particular form or a particular function in individual activity regulation?

The form of an emotion. An emotion manifests as an observable configuration of (peripheral) physiological changes, forms of expression, and forms of experience (Ekman, 1984; Izard & Malatesta, 1987; Meyer, Schützwohl, & Reisenzein, 1993, pp. 22–34; Scherer, 1990). The central issue is whether the form of an emotion changes during the course of development—and, if so, whether a change in form is also accompanied by a change in function.

The function of an emotion in individual activity regulation. To fathom the function of a psychological process, we need a structural model of the complete system in which it is embedded. This complete system is individual activity regulation. It is generally assumed that the function of an emotion is to signal the relation of a person’s motives and significant concerns to his or her (social) environment and to influence subsequent actions in line with these motives (see Campos, Campos, & Barrett, 1989; Frijda, 1986). This leads to the issue of how far emotion-relevant relations between person and environment change over the course of development, or whether new relations and thereby new emotions emerge; and how far a change in emotion-relevant relations is also accompanied by a change in the emotion forms.

The relation of the function of emotion to other psychological functions in activity regulation. At each stage in development, the individual psychological functions form an interrelated system with an internal structure that should permit an adaptive regulation of actions. The question is how far do relations between the emotions and other functions change during the course of development? One could argue that this question has more to do with a theory of activity regulation than a theory of emotional development. However, current research on emotion is studying this topic intensively under the headings “emotion regulation” (see Cole, Martin, & Dennis, 2004; Denham, 1998; Friedlmeier, 1999a, 1999b; Underwood, 1997; Walden & Smith, 1997) and “levels of processing” (van Reekum & Scherer, 1997).

Cultural context. Emotions are based on appraisals that become increasingly mediated during the course of human development by symbol-based meaning systems that are, in turn, the product of cultural development (Averill & Nunley, 1992; Harré, 1986b; Mesquita, Scherer, & Frijda, 1997; Oatley, 1993; Ratner, 2000; Rubin, 1998). Cultural evaluations are conveyed in interaction with socialization partners that may lead to a culture-specific molding of emotions (Friedlmeier, 2005b). The issues are then which cultural features are particularly relevant for emotional development, how are these features imparted, and which consequences do these have for individual development? Within the cultural context, each individual actively shapes his or her development in interaction with his or her personal life contexts—and this leads to the formation of interindividual differences. Both the process of individualization and the role of the cultural context have to be taken into account as a dimension of emotional development.
The different theories on emotional development vary in how thoroughly they address these five dimensions. Theories addressing the qualities of emotions and their functions generally do not handle questions of emotion regulation—that is, questions dealing with the development of the within-system relations of activity regulation. Theories focusing on the universality of human emotions generally neglect the cultural context.

We shall now categorize the theories according to their metatheoretical premises on the “nature” of emotions. We shall sketch the basic principles in each approach and analyze what they contribute to our knowledge about the five dimensions of development given above. By examining the premises to be found in the emotion theories of developmental psychology, we can group them into four families of theories or emotion paradigms that have much in common with more general epistemological research paradigms (see Holodynski & Friedlmeier, 1999). These are:

1. the structuralist emotion paradigm,
2. the functionalist emotion paradigm,
3. the dynamic-systems emotion paradigm, and
4. the sociocultural emotion paradigm.

A similar classification can be found in Mascolo and Griffin (1998b). However, these authors focus on describing their own theories, whereas we present a critical analysis of the research paradigms based on the five dimensions that is designed to single out the most important aspects for an integrative theoretical approach.

We are well aware that the individual emotion theories do not fit our paradigmatic categories completely, and our discussion cannot give credit to the wealth of concrete research findings they have generated. Nonetheless, we believe that integrating these perspectives will produce a more comprehensive picture of emotional development than that provided by any of the existing parts viewed in isolation.

2.1. THE STRUCTURALIST PARADIGM: EMOTION AS A SPECIFIC PSYCHOLOGICAL STATE

The structuralist paradigm views emotion as a specific state of the organism representing a reaction to an emotion-specific cause. From this perspective, science first has to distinguish this state from other psychological states through clear and objectively measurable criteria, before going on to classify the discrete kinds of emotion such as joy, pride, or anger through necessary and sufficient criteria for assigning them to emotion-specific causes. In general, one can say that theories taking a structuralist perspective focus on the form aspect of emotional processes (see the discussions in Campos et al., 1989; Lazarus, 1991, pp. 42–44; Sroufe, 1996, pp. 26–34).
2.1.1. Premises

One first premise in structuralist theories is that each emotion possesses an *objective* and a *subjective component* (see Figure 2.1). The former can be broken down further into an expressive and a bodily component (see Ekman, Friesen, & Ellsworth, 1972; Izard, 1977). Originally, James (1884) defined the bodily component exclusively in terms of visceral reactions. This was later expanded to cover vegetative arousal in the autonomic nervous system, and recent research even includes endocrinological processes as well (see Panksepp, 1998). These bodily processes are generally accessible to (peripheral) physiological measurement.

The current rapid expansion in the neuropsychological analysis of emotions reveals a search for their neurophysiological correlates (see Panksepp, 1998; Rolls, 1999). Because processes in the central nervous system (CNS) underlie all components of emotions, including processes of expression and feeling, we do not assign these CNS processes to the bodily component. We view the neurophysiological level of analysis as a separate systems level that can be distinguished from the psychological systems level, and we consider that neither can be reduced to the other (see Section 3.1.1).

Regarding the expressive component, facial feedback theory has led research to concentrate particularly on facial expressions (Izard, 1977; Tomkins, 1962). However, this component includes all nonverbal behavior such as body posture, motion, gestures, and tone of voice. Collier (1985) even adds eye behavior, personal space, and touch. Such expression is generally accessible to external observation.

The subjective component is composed of the subjective feeling, and is accessible only through introspection. Its assessment is generally restricted to the categorical judgments of individuals who are asked which emotion they are currently experiencing. Hence, from a structuralist perspective, it should be possible

FIGURE 2.1. Emotion in the structuralist paradigm, for example, the differential emotions theory (Izard, 1977).
to describe each emotion through a specific configuration of expressive, bodily, and experiential indicators.

A second premise assumes a regular association between the subjective and the objective component, in that the subjective experience is based on the internal perception of the objective component (see Figure 2.1). The James–Lange theory (Lange & James, 1922/1967) sees this as the subjective perception of visceral changes; the theory of Schachter (Schachter, 1964; Schachter & Singer, 1962) takes vegetative arousal as a necessary condition; and facial feedback theory requires the proprioceptive perception of specific patterns of facial expression (Izard, 1977; Tomkins, 1962) (see Figure 2.1).

More recent definitions of the structure aspect of emotions treat such premises more cautiously, and only talk about a (degree of ) synchronization of the subsystems involved that interact during an emotion episode (see Scherer, 1990, 2001).

2.1.2. Empirical Findings

The history of research reveals major doubts regarding both premises. First, it has not yet been possible to find any empirical confirmation that the presence of certain patterns of expression and/or body processes is either necessary or in itself sufficient for an unequivocal diagnosis of a discrete emotion (Camras, 1992; Ortony & Turner, 1990; Reisenzein, 2000; Russell, 1994). Certainly, some empirical studies have managed to assign prototypical configurations of experiential, expressive, and bodily processes to specific emotions with an above-random frequency (Ekman, 1994; Izard, 1994). Others, however, have shown that these configurations are not the rule in the everyday emotion episodes of adults or even children, and that the same kinds of emotion may also be exhibited through completely different configurations (Camras, 1992; Demos, 1982a, 1982b; Fridlund, 1994).

Second, extensive research has shown that even the association assumed between subjective feeling and objective expressive or bodily processes is not as strong as that assumed theoretically. Persons have been found to report experiencing feelings even when emotion-specific signs could not be observed simultaneously in expression or physical state (see, for summaries, Bermond & Frijda, 1987; Fridlund, 1994). Furthermore, when expressive or vegetative signs were observed, persons’ self-reports did not always confirm experiencing the appropriate subjective feeling (see, for summaries discussing facial feedback theory, Izard, 1994; Manstead, 1988; McIntosh, 1996; for the James–Lange theory and its modifications, Canon, 1929; Reisenzein, 1983).

2.1.3. Discussion

Basically, two conclusions can be drawn from the available findings: First, it seems that emotions can be displayed in a broad variety of forms. Emotion-related prototype research has compiled a number of indicators for the single emotions that,
although not arbitrary, exhibit high interindividual differences (cf. Fahrenberg, 1965; Frijda, Kuipers, & ter-Schure, 1989; Nieuwenhuyse, Offenberg, & Frijda, 1987; Rimé & Giovannini, 1986; Scherer & Tannenbaum, 1986; Scherer, Wallbott, & Summerfield, 1986; Shaver, Schwartz, Kirson, & O’Connor, 1987). This breadth seems to be specific to human beings, because the spectrum of observable forms of expression in animals, even our closest relatives the chimpanzees and bonobos, can be assigned relatively unequivocally to specific emotion qualities (see the descriptions in Bard, 1998; de Waal, 1996, 2000; van Hooff, 1972; van Lawick-Goodall, 1968).

Second, there seems to be no clear relation between the subjective and objective components of emotions. This leads to a lack of clarity regarding how far expressive and bodily processes are in any way necessary for emotional experience.

One consequence of this discussion has been to stop defining the postulated subjective and objective components and their associations as necessary and sufficient criteria, but as a set of prototypical criteria that do not all have to be met in practice. One such explicative definition of emotion comes from Schmidt-Atzert (1996, p. 21, translated):

An emotion is a qualitatively more closely describable state that is accompanied by changes on one or more of the following levels: feeling, bodily state, and expression.

Obviously, such a definition makes the criteria increasingly arbitrary, as Fridlund (1994) points out, and it also fails to provide any orientation that could stimulate further research. This makes it necessary to ask whether the assumptions underlying the structuralist paradigm are inadequate because of their emphasis on the study of single emotions.

2.1.4. Conclusions for an Integrative Approach

In the following, we shall present one possible way of defining the potential relation between subjective and objective components of emotions that would enable it to account for the discrepant empirical findings. This simultaneously reaffirms the importance of the structuralist paradigm.

Up to now, scientific research on emotions has taken it for granted that they have to be analyzed from an observer perspective. However, for psychology, and particularly for research on emotion, it can be very informative to study them from the perspective of the actor. It is conceivable that the assumed synchronicity of experiential, expressive, and bodily processes might still be found in the actor-perspective, even when it is lacking for observers.

The expression of an emotion that can be perceived by others and the vegetative arousal assessed with corresponding measurement instruments can, in principle, also be perceived by the person concerned. This would involve proprioceptive feedback from the muscles and the corresponding interoceptive feedback processed
and stored in the somatosensory regions of the brain (Damasio, 1994; Vaitl, 1995). Some theorists in the field of emotions (Damasio, 1994; Gellhorn, 1964; Izard, 1977) consider these emotion-specific feedback patterns to be the “sensory stuff” constituting the subjective feeling of the emotions. Damasio (1994) has coined the term somatic marker for this.

This “sensory nature” of an emotion is important, because there has to be a difference between a situation in which a person only knows that he or she has experienced a certain emotion or would experience it because of situational cues, and a situation in which he or she actually feels the emotion. This difference does not consist in knowledge, in thoughts over the reason for the emotion, but in the perception of internal signals that seem to be typical for the corresponding emotion and give it its specific sensory nature: aches in the pit of the stomach, a clenching in the throat, a light and airy feeling of delight, a shiver down the spine, or butterflies in the tummy. We view this specific sensory nature as an essential criterion for defining subjective feeling.

The next important question is whether this internal feedback always has to occur (i.e., at every stage of development) on the basis of real-life bodily and/or expressive processes, or whether it can involve internal mental representations that may occur without such a bodily feedback loop. Research on pain and psychosomatics provides enough indications that phantom sensations are perceived subjectively as real physical processes (Melzack, 1989).

Transferred to the feeling experience, one could ask whether it is possible for a person to report experiencing the corresponding emotion when given an emotion-specific cause, even when it is impossible to either observe a corresponding expression or measure a corresponding bodily reaction. The person, in contrast, feels an emotion-specific expression and also considers himself or herself to be physiologically aroused. For this person, a sign of anger may be to curse under one’s breath rather than out loud, to feel a frown that is invisible from the outside, or to feel an inner tension that cannot be assessed with peripheral physiological measurements.

Damasio (1994) called this form of feeling “as-if feelings.” Izard (1977) also admitted that such micromomentary expressive movements might be possible (see, also, Church, 1982), and Holodynski (1997) has talked about mental expression signs.

From the perspective of the actor, such mental expression signs seem to generate a pattern of experience that is comparable to actually exhibited emotions. However, this would mean that the synchronicity of bodily and expressive processes could still exist in subjective feeling even when feeling and expression are dissociated from the observer perspective. If this is true, then we can go back and start looking for necessary or at least sufficient forms of an emotion again—with the difference being that we are now dealing with subjectively perceived rather than objective forms. In Section 3.1.4, we shall consider under what circumstances this might be possible. In Section 3.1.3, we shall also take a critical look at those experiments.
claiming to have rejected the presumed convergence between expression and experience or between vegetative arousal and feeling, and in Section 4.5, we shall present some of our own research on this topic.

However, the purported independence between objective and subjective forms of emotions found in the history of research has disrupted the search for necessary and sufficient forms of an emotion, and led to the adoption of another criterion for defining an emotion that is more unequivocal. This step has been taken within the framework of the functionalist paradigm.

### 2.2. THE FUNCTIONALIST PARADIGM: EMOTION AS A PSYCHOLOGICAL FUNCTION

The difficulties in finding any clear confirmation of the assumptions in the structuralist model led scientific analysis to range even further afield. The analysis of emotions as a specific psychological state was expanded through the analysis of their function.

Although emotion theories with a functionalist orientation already existed in the 1960s and 1970s (e.g., Arnold, 1960; Lazarus, 1966; Leont’ev, 1978), they became popular only in the 1980s. This is documented by a clear change in the definitions of emotion (see Campos et al., 1989). In emotion research within developmental psychology, this change is marked particularly by the work of Campos (Campos & Barrett, 1984) and Sroufe (1979). In general psychology, the major representative of this new perspective is Frijda (1986) with his book *The Emotions*.

#### 2.2.1. PREMISES

A functionalist research paradigm no longer defines a discrete emotion as a configuration of emotion forms, but in terms of the *function it adopts within the system of individual activity regulation* (Frijda, 1986; Lazarus, 1991). This extends the level of analysis, because an emotion can no longer be defined through an elementaristic inspection of an isolated psychological function. It makes it necessary to analyze the individual’s activity regulation within his or her environment. The function of an emotion is revealed only through such a system analysis.

How can we sketch this system of activity regulation? Persons are viewed as beings who, at any given point in time, possess a series of different concerns, motives, and personal goals that they try to satisfy or achieve in interaction with the environment. “The term concern refers to major goals and motives, likes and dislikes, and norms and values” (Frijda, Ortony, Sonnemans, & Clore, 1992, p. 67). For example, persons can purchase food in order to satisfy their need to eat; they can seek contact with significant others in order to satisfy their need for attachment; or they can strive to become a famous actor or actress in order to satisfy their need for success. In the activity regulation system, psychological processes such
as perception, cognition, memory, emotion, and motivation are linked together to form a functional unity in which the emotions acquire two particular functions.

**Appraisal.** The flow of external and internal stimuli reaching the person in the form of (real or imagined) objects, persons, and events is evaluated continuously to see how far it promotes, impedes, or harms the satisfaction of individual motives and major concerns (Frijda, 1986). These appraisals trigger the “actual” emotion. Anger, for example, contains, according to Malatesta and Wilson (1988), the appraisal that the attainment of an important goal (motive) is being blocked.

**Action readiness.** The action readiness triggered by the appraisal should modify the relationship to the environment in a way that promotes one’s motives. This can take either the form of a perceived readiness to do or stop doing something specific or that of an expression designed to influence a communication partner in line with personal motives. For example, a threatening gesture can ensue, when the source is another person who should be induced to stop blocking the goal (see Malatesta & Wilson, 1988). Action readiness can also take the form of a peripheral reaction in the autonomous nervous system (ANS) to ready the body to initiate processes of action and expression. Anger shifts the action readiness in the direction of overcoming the source of the goal blockage. Action readiness, in turn, leads to the selection of appropriate behavior designed to satisfy motives under the given context conditions. In human beings, these behavior are goal-directed actions that can be selected voluntarily. They are learned during ontogenesis and form systems of flexibly combinable actions.

Hence, the kind of emotion that emerges depends on what significance the individual assigns to the current event. This leads to a specific relational meaning (Lazarus, 1991), and triggers a corresponding action readiness (Frijda, 1986) (see Figure 2.2).

As a result, a specific configuration of motive-related appraisal processes is a necessary criterion for a functionalist definition of an emotion. This notion has triggered discussions on whether appraisal processes should be conceived as a prior condition or as a genuine component of an emotion. In either case, the connections between the pattern of appraisal and the kind of emotion are assumed to be regular (see Lazarus, 1991). The number of different kinds of emotion that can be distinguished thereby depends on the number of discriminable appraisal patterns.

### 2.2.2. Empirical Findings

Research on emotion theories in general psychology has focused primarily on how these appraisal patterns are constructed and how they should be classified. This is conceived differently from theory to theory (Frijda, 1986; Lazarus, 1991; Leventhal & Scherer, 1987; Ortony, Clore, & Collins, 1988; Roseman, 1991; Scherer, 1993; see, for overviews, Roseman & Smith, 2001; Scherer, 1988). However, these classification attempts contain no statements on the ontogenetic development of these appraisal patterns.
Most theories oriented toward developmental psychology have concentrated on the development of the appraisal patterns for individual emotions, for example, appraisal development in pride and shame (Barrett, 1998; Mascolo & Harkins, 1998; Stipek, 1995; Tangney & Fischer, 1995), in self-evaluative emotions (Geppert & Heckhausen, 1990), or in anger (Mascolo & Griffin, 1998a). Comprehensive developmental models of appraisal patterns have been presented by Sroufe (1979, 1996) and Campos and Barrett (1984).

2.2.3. Discussion

Despite the elegance and clarity of this functionalist definition of emotion, it raises one major new problem, namely, how to differentiate between knowledge and appraisal (see Lazurus, 1991, pp. 144–149). The functionalist approach to emotions is criticized as being too cognitive, and that it blurs the distinction between a “cold cognition” and a “hot emotion.”

Human beings are unique in their ability to represent the world symbolically (including the self and its relationship to the world). As a result, we do not just go through life “feeling” and “acting,” but also, and above all, “knowing.” Moreover, this knowledge about how things function in general and in particular and what they mean is essential if an act is to be performed appropriately. For example, an adult generally knows what emotions signify, that, for example, the death of a loved one triggers mourning because of irrevocable loss. However, is the knowledge-based recall of the relational meaning of an emotion already an appraisal process? Supporters of a functionalist perspective would say that knowledge
becomes an emotion-triggering appraisal only when an event attains personal significance.

Let us imagine a situation in which a person’s aunt has died. She reports how she had loved her aunt like a mother and that her death was a painful loss. This verbalizes the appraisal that should be decisive to trigger mourning. Can we then conclude beyond doubt that the emotion of mourning is induced at the moment of her verbal statement? This would have to be so, because the death of her beloved aunt really does mean an irrevocable loss.

One would certainly agree if the person were to cry or exhibit other expressive or bodily signs of mourning. One would certainly not agree if she were to make her verbal statement without simultaneously feeling or exhibiting mourning, for example, when reporting this information to her employer. One would then say, in line with Lazarus (1991, p. 144), that this is a “cold cognition” and not a “hot emotion.”

This clarifies that the form in which the appraisal of an event occurs does not seem to be arbitrary. This is also reflected in the functionalist definition of emotion in which the motive-related appraisal process is necessary but not sufficient. It needs to be augmented with the appraisal-triggered action readiness in the form of experiential, expressive, or bodily processes. The decisive issue, however, is which indicators should be used to read off such an action readiness. To experience mourning, for example, is it enough to feel low drive or the impulse to shed tears, even when no expressive or bodily processes can be observed at the same time?

The question regarding the sufficient conditions for an emotion is also a personal concern. When can one be certain that one actually feels an emotion and does not just believe that one is feeling it? This is not just a theoretical issue; it also has practical consequences. Persons may mistake appraisals for knowledge and vice versa in their daily activities. They may believe incorrectly that they are experiencing emotions or, vice versa, they may have inappropriate or no knowledge of actual emotions and be unable to integrate them adequately into their own conscious action regulation. This can have disastrous personal consequences that may even lead to mental disturbances. Nowadays, a complete branch of professionals deal with these consequences.

A more precise analysis of the functionalist definition of emotion brings us back to where our argument started: It is obviously not enough to define emotions as two functions for an individual’s activity regulation in his or her environment; namely (1) as appraisal (of the events in the environment in order to pursue personal motives) and (2) as action readiness (to prepare to modify the person–environment relationship in order to pursue personal motives).

As plausible as these two functions may seem, they do not overcome the old problem confronting a structuralist definition of emotions. Whether an emotion actually is experienced or is only something that one is aware of does not just depend on the appraisal of the situation. It also depends on the form in which
action readiness is present: whether as a feeling, a perceivable expression, and/or a bodily process. Lazarus (1991, p. 59) assumes, for example, that peripheral physiological processes are a necessary condition, even if they are only very weak. This implies that the functionalist definition of emotion also possesses a form aspect, thus confronting it with the same old unresolved problem as before: Are there invariant ties between feeling, expression, and bodily reactions that are necessary and sufficient for a specific kind of emotion? Can, as in our example, a person experience mourning without an observer being able to perceive signs of expression and measure peripheral physiological reactions? Indeed, is the search for a scientifically precise definition of emotions simply going round and round in circles?

2.2.4. CONCLUSIONS FOR AN INTEGRATIVE APPROACH

We have already sketched one possible way out of this dilemma when discussing the structuralist paradigm. We considered that subjective feeling might also take the form of what we called mental signs of an emotion. We wish to extend our stance to cover the developmental perspective here and clarify some consequences for empirical research.

There can be no doubt that emotions fulfill the function in the activity regulation system of appraising external and internal stimuli in line with motives and modifying the relation between the person and his or her environment accordingly. However, how does an individual notice that he or she is experiencing an emotion, and what does he or she use to evaluate external events in terms of personal motives? This focuses our attention once again on the emotion forms. The decisive criterion for the induction of an emotion is that the person’s emotional feeling must contain a necessary and sufficient configuration of emotion-specific expressive and bodily reactions. A person feels an emotion only when specific expressive and bodily signs appear. Therefore, we claim that there also has to be a unity of experiential, expressive, and physical sensations even when neither expression can be observed by outsiders nor bodily reactions can be measured in the physiological periphery.

But what is the form of this unity of experiential, expressive, and bodily reactions? We assume that this form changes during ontogenesis. Mental expression signs and somatic markers (Damasio, 1994) emerge and are stored in memory. As a result, the subjective experience of expressive and bodily reactions can take two different forms.

First, the subjective experience of expressive and bodily processes comes about through the introspective perception of the real interoceptive and proprioceptive feedback from the body triggered by appraisal processes. These expressive and bodily processes can be assessed through external observation and peripheral physiological measurements.
Second, the subjective experience of expressive and bodily processes emerges when the introspective perception of interoceptive and proprioceptive feedback stored by the CNS is triggered by appraisal processes. These are the mental emotion signs.

What both forms of experience have in common is the subjective sensations of emotion-specific expressive and bodily reactions, their focus on the cause, and the involuntariness with which they enter experience. Their experience is not an outcome of a purposeful effort. However, it is possible to put oneself into emotion inducing situations purposefully or to imagine those situations in such a way that the emotion signs will be triggered involuntarily.

Such a claim is not just a “theoretical trick” designed to save the structuralist definition of necessary and sufficient forms of emotion. It seems to provide a realistic solution and fulfill an adaptive purpose from developmental psychological perspectives. The problem is as follows: Must the expressive and bodily processes that one associates with emotions always be present in an objectively measurable form in order to fulfill their action readiness function? Or do action readiness functions exist in forms that are accessible only to the person’s experience and not to an external observer? Can these fulfill this function completely and maybe even more efficiently? This makes it necessary to abandon the accepted notion that the emotion forms have an exclusively instrumental function for action readiness (e.g., to activate the body so that it is ready to flee from danger). Instead, one has to consider the idea that emotion forms might also have an exclusively semiotic function, a sign function (e.g., to only signal danger without activating preparation for flight). It is only when emotion forms are exclusively used as a sign for the person herself or himself that persons can feel bodily and expressive signs in their subjective feeling that are inaccessible to an observer.

This is because signs, unlike instrumental acts, can drop their material form without impairing their intrapersonal function for regulating actions. For example, one can regulate one’s own actions by using audible speech; one can, however, also use inner speech. Audible and inner speech are of different material form. We shall discuss this relation in more detail in Section 3.1.4.

Such a potential solution leads to new questions in the analysis of ontogenesis. How do emotion forms develop in the form of signs? Under which conditions are they used as signs for other persons, and when are they used as signs for the self? Regarding the latter, do they actually turn into mental emotion signs? Obviously this is not the starting point of development in neonates, but a later state of development that is more characteristic of adults.

*However, it should be noted that the subjective forms are always tied to measurable cerebral processes. By expressive and bodily reactions, we mean processes that can be measured through external observation of the expression and through peripheral physiological recordings. It is such processes that are addressed in the structuralist definitions and not their physiological correlates in the brain.
2.2.5. **DIFFERENTIATION OF LEVELS OF EMOTIONAL PROCESSING AND EMOTION REGULATION**

Within the framework of the functionalist paradigm, two further important findings are significant for the issue addressed above in particular but also for emotional development in general: the differentiation of levels of processing and the analysis of emotion regulation.

*Levels of processing.* Leventhal and Scherer (1987) have pointed out that the individual action system does not just develop horizontally by separating into distinct emotions and states of action readiness. It also develops vertically by constructing a hierarchy of levels of processing (see Table 2.1).

For Leventhal and Scherer (1987), the sensorimotor level is the lowest and most basic level of processing. The first appraisal processes are based on mostly innate pattern recognitions and reflexes that specialize in processing specific patterns of stimuli. For example, a substance leaving a bitter taste in the mouth triggers a spitting out reaction. A second, hierarchically superior level of processing forms on this basis during ontogenesis, namely, the schematic level. On this level, the specific relation between stimulus and subject is appraised in relation to motives, and adaptive states of action readiness are triggered. These appraisal patterns are the product of the individual learning biography and can be conceived as abstract representations of learned reactions to specific patterns of stimuli (Leventhal & Scherer, 1987). In other words, this is the level on which learning through classic and operant conditioning is particularly effective. However, even this second level does not suffice to provide a complete reflection of the emotional process. A further level of processing develops successively from the schematic level, and

<table>
<thead>
<tr>
<th>Table 2.1. Levels of Processing for Appraisals^a</th>
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<tr>
<td>Novelty</td>
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<td>---------</td>
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<tr>
<td><strong>Conceptual level</strong></td>
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<tr>
<td>Expectations: cause/efect, probability</td>
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<tr>
<td><strong>Schematic level</strong></td>
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<tr>
<td>Familiarity; schema matching</td>
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<tr>
<td><strong>Sensorimotor level</strong></td>
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<tr>
<td>Sudden, intense stimulation</td>
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^a Adapted from Leventhal and Scherer (1987, p. 17).
this third level is concept-based (conceptual level). It contains propositionally organized knowledge structures concerning emotions as well as mechanisms and procedures for intentionally applying this knowledge in order to influence and regulate one’s emotions. Hence, a complete description of the emotional process has to take account of the sensorimotor, schematic, and concept-based levels of processing and their complex interactions. The degree to which each of these levels is differentiated is the outcome of ontogenesis.

Emotion regulation. Leventhal and Scherer (1987) have concentrated on specifying the appraisal processes on the different levels in their three-level model. Up to now, there has been no differentiated analysis of the coping actions that follow the emotional action readiness. It has simply been assumed that an emotion initiates an appropriate coping action, and the performance of this action modifies the relation between the person and the environment to suit his or her motives.

Lazarus and Folkman (1984) have worked out a basic differentiation of coping actions. A coping action can be directed toward the context and can modify it in line with motives. For example, being angry about poor service in a restaurant can lead to a complaint in the hope that this will improve service. However, a coping action can also be directed toward one’s own emotion and modify the appraisal process. Being angry about poor service would then be given a new interpretation considering the need to take account of the probability that the waiter had had a very hard day. Such a reinterpretation would transform anger into sympathy and, thereby, change the quality of the emotion without bringing about any changes in situational conditions. Lazarus and Folkman (1984) call the former type of coping problem-focused and the latter emotion-focused.

The observation that the coping action can also exert an influence on the emotion itself—what Lazarus and Folkman (1984) call reappraisal—means that emotions do not just regulate the actions of the individual but also, vice versa, the actions of the individual can regulate emotions. This possibility of feedback between coping action and emotion underlines the interdependent character of emotions and actions (Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983). Emotion regulation covers all processes involved in the production, maintenance, and modulation of emotional episodes (Bridges & Grolnick, 1995). Developmental psychology started to study this aspect intensively in the 1990s under the heading “development of emotion regulation” (see Bridges & Grolnick, 1995; Campos et al., 1989; Garber & Dodge, 1991; Thompson, 1990, 1994).

The use of regulation strategies can lead to the emergence of a new quality of action regulation during the course of development. The individual is no longer obliged to just go along with his or her emotions and their accompanying states of action readiness, but can exert an active influence on the impact of his or her own emotions and organize them into a hierarchy. For example, one can also persist in performing an action leading to one’s goal even when this action triggers the emotion boredom. It is precisely this ability to organize one’s emotions into a
hierarchy as a function of the context and one’s own motives that discriminates childish reactions from adult ones. An elementary schoolchild may well have the same emotions as a preschool child, but the ability to organize his or her emotions into a hierarchy gives the former a more mature and flexible action regulation.

Although the existence of such regulation strategies is undisputed, developmental psychology still has to clarify which regulation strategies enable such a reorganization of activity regulation, and which mechanisms lead to their emergence in ontogenesis. The literature on the development of emotion regulation reveals a series of classification attempts. For example, Thompson (1990) distinguishes seven classes of strategies: directing attention, arousal and inhibition processes in the CNS, (re)interpretation of emotional causes, interpretation and influencing of internal arousal processes, access to external coping resources, anticipated selection of contexts, and selection of response alternatives. Bridges and Grolnick (1995) distinguish four classes of strategies: attention regulation, self-calming strategies, interactive regulation strategies, and symbolic or verbal strategies. There is now a lot of research on the age at which children generally learn and apply these strategies, and this has shown that there is a wide range of interindividual differences (see Denham, 1998; Eisenberg & Fabes, 1992; Friedlmeier, 1999a; Murphy, Eisenberg, Fabes, Shepard, & Guthrie, 1999).

2.2.6. Conclusions for an Integrative Approach

The separation into distinct levels of emotional processing and the inclusion of emotion regulation as a component of emotional development provide important foundations for a theory of emotional development that also contains and can conceptualize qualitative change. At the same time, however, we think that the concepts presented so far require some modification:

1. Leventhal and Scherer’s levels-of-processing model (Leventhal & Scherer, 1987) does not introduce the symbolic processes that permit the acquisition of cultural systems of meaning till the concept-based level. However, there are some indications that this symbolic mediation is already effective on the schematic level. At the onset of language acquisition, perceived objects and contents are not just given names but also a culturally produced meaning tied to each name. This categorical meaning then structures and schematizes perception and the interpretation of what is perceived, and this also prestructures the appraisal processes. Emotion theories with a coconstructivist orientation deal precisely with this point (see Harré, 1986b; Lewis & Michalson, 1982).

2. The potentials for regulation resulting from such a hierarchical organization of the individual activity system should also be specified further. The concept-based level does not just contain declarative knowledge but also,
and in particular, procedural knowledge on how to intervene in the emotional process. This procedural knowledge also contains symbol-mediated regulation strategies. It can be applied purposefully to influence emotions in line with conscious goal intentions and thus to optimize action regulation. These aspects are currently being discussed under the heading “emotional intelligence” (see Saarni, 1999; Salovey & Sluyter, 1997).

3. We consider a classification of regulation strategies that pays more attention to their functionality for action regulation and their emergence in ontogenesis to be more appropriate than the ones discussed. We shall address this more closely in Section 3.4.4.

4. To explain the fourth critical issue, we shall have to provide more background information: Functionalist theories share the notion that new kinds of emotion and new forms of emotion regulation develop during ontogenesis. A number of theories have been presented that try to describe the process of development by which emotions emerge and become distinct (e.g., Bertenthal, Campos, & Kermoian, 1994; Campos et al., 1996; Sroufe, 1996). They assume development to be a continuous process; that is, new kinds of later emotions emerge from earlier ones. This must make it possible to find transitions in the course of development during which something new forms on the basis of previous structures and processes. It is precisely these transitions that a developmental theory should be able to model.

A closer inspection of findings from functionalist research reveals that what it actually is doing is describing developmental stages and their sequence in ontogenesis. In part, it is also specifying preconditions for when a new developmental stage can be reached, and reporting a general learning mechanism for how this transition occurs (e.g., Bertenthal et al., 1994; Campos et al., 1996; Sroufe, 1996).

However, there is a blank space here. There is a lack of models able to describe the process of change from one quality into another, that is, to describe exactly what happens in the transition from one stage to the next. How can the new emerge from the old if the new does not exist already?

A second blank space in functionalist theories is associated with the lack of models of the development process. Existing research describes stages of development and concentrates particularly on that which all children located at the corresponding stage have in common. The theories describe the general case, whereas the single case, the individual idiosyncrasy, is viewed as an unimportant variation of the general. However, the general always manifests in an individual idiosyncrasy; everybody has his or her own personal biography that makes him or her a unique personality. Sufficient attention has not been paid to this process of individualization in ontogenesis.

Both blank spaces, first, modeling the transitions between stages of development and, second, the individualization problem regarding the relation between
general developmental steps and their individual manifestation, are a particular focus of attention in the dynamic-systems emotion paradigm. Its metatheoretical principles seem to make it an ideal candidate for filling in these blank spaces.

2.3. THE DYNAMIC-SYSTEMS PARADIGM: EMOTION AS AN EVOLVING SYSTEM

The dynamic-systems paradigm is an interdisciplinary approach to explaining how systems develop (Haken, 1977; Kauffman, 1993; Prigogine & Stengers, 1984). The assumption is that a coherent system structure evolves out of the, in part, random but, above all, recursive interplay between numerous system parts, and that this self-organizing process leads to the emergence of further, more complex structures during the course of development.

This paradigm does not come from psychology, but from the study of the dynamics of complex systems in the natural sciences. Examples are the emergence of chaotic weather sequences in meteorology, turbulent currents in physics, or living systems in biology. However, this paradigm should be applicable to all dynamic systems. In principle, it was only a question of time before it was also transferred to the system of emotions. An emotion can also be described as a dynamic system involving the interaction of a multitude of components that produces new orders during the course of its development (see Lewis & Granic, 2000).

2.3.1. PREMISES

Lewis (2000) has summarized the general principles of self-organization as follows.

On a microscopic or lower order level, systems consist of many single parts in a state of interaction. That is, the output of one part is the input of the other and vice versa. This sets off reciprocal processes of amplification and attenuation. The outcome of these innumerable recursive interactions is the emergence of an order on the macroscopic or higher order systems level. This, in turn, has repercussions for the lower order level by channeling the interactions of the parts in a way that maintains this order (coupling). This self-organizing order is called simply “self-organization.”

The product of this circular causality between lower order and higher order levels is a stable system state known as the attractor. The order on the higher level is self-stabilizing. If the system is disturbed by outside perturbations, it returns more or less rapidly to the attractor state through the coupling of the system parts. Living systems generally have many coexisting attractors and are characterized by multistability.
Self-organizing systems become more ordered as time goes by, and this orderliness emerges spontaneously, that is, without any programming or instruction. The orderliness is restricted to a small number of stable states. As a result, the system repeatedly crosses thresholds of instability on the path from one orderly pattern to the next. This means that self-organizing systems tend to jump abruptly into new orderly patterns rather than changing in a gradual or linear manner. These jumps, known as phase transitions, occur when the system breaks down, when the sensitivity to perturbations increases, and when new patterns of organization rapidly self-amplify.

Self-organizing systems become increasingly deterministic. The many degrees of freedom they start with reduce continuously as they become more specific during the course of development. The outcome of a growth process constrains the conditions for further growth. Lewis (2000, p. 40) calls these “cascading constraints,” because every node in a converging order restricts the options available to the next state, and later changes have to be compatible with the existing underlying orderliness.

Self-organizing systems are more sensitive to perturbations at early stages of development compared with later stages. This axiom is known as the “sensitive dependence on initial conditions” (Lewis, 2000, p. 39).

Self-organizing systems become increasingly complex. Their increasing orderliness permits a more intricate arrangement of interacting parts and processes.

Nowadays, there are a number of psychological emotion theories based on a dynamic-systems perspective. The first overview can be found in Lewis and Granic’s book (Lewis & Granic, 2000). This covers approaches oriented toward general psychology focusing on the microgenesis of an emotional episode as well as approaches oriented toward developmental psychology focusing on the ontogenetic construction of new emotion structures. Although they share the same metatheoretical principles, the different theories diverge strongly in the way they conceptualize an emotion system.

Lewis and Douglas (1998) take a basic emotion approach extended by a dynamic-systems perspective. They view emotions as modular, innate systems that (1) are characterized by a specific kind of feeling, (2) are physiologically and phenomenologically similar across individuals and cultures, (3) are triggered by specific causes linked to the goals of the organism, and (4) elicit a specific class of responses and facilitate cognitive activities that support these responses. Emotion and cognition are viewed as separate modular systems that enter into continuous self-organizing interactions in ontogenesis. Emotions promote the coupling of conceptual elements, in particular, their integration into larger units possessing a semantic meaning. These unending self-organization processes lead to the formation of stable, meaningful patterns for interpreting situational facts, so-called emotional interpretations, which then become attractors. Support for the theoretical assumptions underlying this emotion–cognition coupling comes from analogies to
neurophysiological findings (Damasio, 1994; Freeman, 1995; Harkness & Tucker, 2000; Schore, 1997).

This approach offers an explanation for two questions that cannot be assessed adequately with a structuralist approach of basic emotions and even go beyond the functionalist approach:

1. How do personality-specific patterns of emotional reactions develop?
2. How do cumulations of single emotional experiences impact on further development?

Lewis (2000) distinguishes three timescales of emotional self-organization: First, the microgenetic development of an emotion episode takes seconds and minutes. Second, the mesogenetic course of moods lasts for several hours or days. Moods arise because certain attractors are amplified whereas others are attenuated. One possible cause for this may be the failure to transform an emotion into action. Then, the state persists, even though the person may well be unaware of it. This is also supported by neurophysiological findings (Freeman, 1995). The third timescale, the macrogenetic development of the personality, proceeds over longer periods of time (months and years) and is characterized by the crystallization of certain attractors as a result of recurring emotional experiences and also, above all, recurring moods (Harkness & Tucker, 2000). Although the dynamic interaction between goals, plans, and emotional interpretations makes emotional development hard to predict, certain phases can be ascertained, as Lewis and Douglas (1998) have demonstrated for the example of defending the self from negative emotional states.

In their component systems approach, Mascolo, Harkins, and Harakal (2000) conceptualize emotional development in an even more overt model than that of Lewis (see Figure 2.3). Their theory makes three basic assumptions:

1. Emotional states, which refer to a complete emotional episode, and emotional experiences, which refer to the phenomenal aspects of an emotional state, are composed of multiple component processes. They consider these to include appraisals as motive-relevant interpretations; affect-producing systems such as the CNS, the ANS, and bodily reactions that generate the feeling tone; and the overt action system composed of involuntary facial and vocal reactions as well as voluntary actions.
2. Emotional experiences develop through the mutual regulation of the component systems over time and within specific social contexts.
3. Component systems are context-sensitive; that is, they do not just adjust themselves to each other but also to the continuous changes in social context.
As such, emotional experiences self-organize . . . into a series of more or less stable patterns or attractors that yield a large number of minor variations. (Mascolo et al., 2000, p. 127, italics added)

This is why there is no single plan for the organization of any class of emotions, and no single component is primarily responsible for the genesis and production of an emotion.

Fogel, Nwokah, Dedo et al. (1992) propose a similarly overt developmental model. Unlike Mascolo et al. (2000), they focus more strongly on the social context, and therefore also talk about a social process theory of emotion: “Emotions are . . . socially constructed, dynamically created out of the interaction between contextual variables and component synergies, without the benefit of a central executive control agent” (Dickson et al., 1998, p. 256). They focus particularly
on emotional development within the caregiver–child dyad during the first year of life.

2.3.2. Empirical Findings

The dynamic-systems perspective focuses on modeling transitions. These can be the microgenetic course of an emotion episode or the ontogenetic emergence of new kinds of emotion. The latter would require the repeated study of single systems such as one caregiver–child dyad across many measurement times in order to show that there are some phases with a very stable structure in which external perturbations return repeatedly to established attractors and other phases in which such perturbations lead to chaotic reactions in the system. During the latter, the system shifts into phase transition, and it is then necessary to show how a new structure stabilizes out of this chaotic behavior. This perspective requires new methods such as time-series designs using nonlinear data analysis techniques.

A number of empirical studies on the development of emotions are now available: for example, on the regulation of emotions between mother and neonate during a separation episode (Lewis & Douglas, 1998), on the development of anger (Mascolo & Griffin, 1998a), on the development of pride (Mascolo & Harkins, 1998), and on the development of smiling in the first year of life (Dickson et al., 1998). However, these studies used mostly linear statistical methods, although these methods do not allow to test the proposed nonlinear individual courses.

2.3.3. Discussion

The focus of a dynamic-systems perspective is on describing and explaining how new system structures may emerge from existing ones. On a metatheoretical level, it provides a conceptual tool that can describe the emergence of new system structures and properties as well as the individualization of the system over the course of its development. However, it is only just beginning to be applied to emotional development. Basically, two aspects require further comment.

*Only a terminological reformulation of known concepts?* Initially, the application of dynamic-systems concepts to describe emotional development is only a reformulation of known facts, as Lewis and Douglas (1998, p. 162) themselves admit. The psychological terminology applied by, for example, Lewis (2000) basically comes from existing theories with only marginal reformulations. All that is new is the replacement of psychological terminology with the metatheoretical terminology of the dynamic-systems paradigm. Emotions as stable configurations of emotion forms are labeled attractors, just like the attractors identified in meteorology.
transitions between developmental stages are called phase transitions. However, simply replacing subject-specific terms with more general metatheoretical terms does not provide us with an explanation of the psychological facts.

**Lack of empirical confirmation.** The suitability of the dynamic-systems perspective cannot be confirmed on a purely theoretical level. Empirical proof is needed. This would require microgenetic or ontogenetic time-series designs using nonlinear data analysis techniques and/or computer simulations. However, up to now, there has been hardly any research using such complex methods (see Eid, 2001; Lewis & Douglas, 1998; Wehrle & Scherer, 2001). Any empirical confirmation of the self-organizing nature of a system would require a continuous, fine-graded observation of a system’s course of development over a longer period of time. Such data then have to show that the system structure moves continuously toward stable attractors under certain framing conditions, but it acquires chaotic features under others. However, when the framing conditions change again, these chaotic features should stabilize into new attractors.

Without empirical support, the principle of self-organization becomes a *deus ex machina*: It is unable to model the course of the process precisely—either empirically or with the help of computer simulations. Instead, it points to the complex and innumerable interactions of the system parts and proposes some form of miraculous self-organization. This “black box” then somehow produces exactly that order that one wishes to explain. However, what exactly is the “control parameter” that Dickson *et al.* (1998) consider to be responsible for the emergence of different forms of smiling in the neonate? How precisely do the different forms of anger emerge that Mascolo and Griffin (1998a) differentiate with their cluster analysis of a child’s forms of anger? How exactly do longer lasting moods emerge, according to Lewis (2000), from a recursive sequence of single emotion episodes? What exactly is the control parameter or are the control parameters in the formation of new kinds of emotion? At present, dynamic-systems approaches have conceived only discriminable stages of development in single emotions. However, other approaches have managed to advance just as far without applying dynamic-systems terminology (see Barrett & Campos, 1987; Campos *et al.*, 1996; Sroufe, 1996). We are still waiting for researchers to perform the part that is actually new, namely, the modeling of transitions.

### 2.3.4. Conclusions for an Integrative Approach

Dynamic-systems approaches assume that emotional development is based on the dynamic interplay of a number of system components ranging from internal mental processes to the interaction with the social context. This is the basis for an individualization of emotional responses in ontogenesis. Processes of
habituation or of crystallization based on recurring experiences are considered to be particularly crucial. Nonetheless, it is questionable whether a theory of emotional development requires such a detailed specification of components and their complex interactions.

We consider that two major aspects need to be analyzed more precisely in the dynamic-systems approaches:

1. Prior approaches have offered only vague definitions of the control parameters under which the system should change. Each person contributes a species-specific developmental potential for a differentiated emotionality. However, the formation of new kinds of emotion does not occur by itself, but only under certain framing conditions. At times, the self-organization approach seems to forget this (but see Lewis & Granic, 1999). Applied to emotional development, we have to ask:
   (a) What exactly is (or are) the control parameter(s) in the formation of new kinds of emotion?
   (b) What forms must these control parameters take if a new kind of emotion is to emerge? For example, how does pride over a success emerge from joy at an outcome, or shame over a failure emerge from disappointment or anger over an unsuccessful effect?
   (c) Which preconditions are necessary for any change at all to occur in the control parameters; that is, what are the framing conditions of the system?

2. The previous approaches have defined the potentials of the system of the “human being” only insufficiently. The developmental components attributed to the human system already exist in primates. However, it is not every system that produces new orders out of itself. It has to have the species-specific developmental potential to do this. There is increasing consensus that emotions should be attributed to mammals as well—particularly our closest relatives the chimpanzees and bonobos. Moreover, they should also be attributed to all the above-mentioned components such as appraisal processes and action readiness in the form of experience, expression, and physiological response patterns (Bard, 1998; Suomi, 1984). However, chimpanzees and bonobos possess a far more restricted inventory of emotions than do human beings, and these also express themselves in highly stable, species-specific emotion forms (see de Waal, 1996, 2000; van Lawick-Goodall, 1968). This does not seem to be the case in human beings. How can we explain this major difference? One would certainly talk about the human capacity for symbolic representation, but how far can precisely this difference bring about such large differences? Our answer is to broaden the perspective yet again—this time, to cover humans as culture-producing beings.
2.4. THE SOCIOCULTURAL PARADIGM: EMOTION AS A COCONSTRUCTED PSYCHOLOGICAL FUNCTION

The paradigms described so far view emotions from a predominantly intrapsychological perspective. The structuralist paradigm focuses on internal processes that do not go beyond the individual’s physical borders. The functionalist paradigm broadens the unit of analysis to include the function of emotions in a person’s action regulation, but also restricts itself primarily to the actions of the single person. Nonetheless, it has to be said that some functionalist approaches in developmental psychology do view the social context, in particular, the caregiver–child interaction in early childhood, as a major proximal feature of development (Saarni, Mumme, & Campos, 1998; Sroufe, 1996). The dynamic-systems perspective does include the proximal social context (see Mascolo et al., 2000), but the emphasis on self-organization often pushes this precondition into the background. However, its understanding of “social context” does not provide a framework for studying the distal conditions that make the human activity system seem so unique. This calls for a broader outlook that includes a “sociocultural context,” and views persons as culture-producing beings.

2.4.1. PREMISES

The integration of the social and cultural context into the analysis of emotions is the domain of the sociocultural paradigm. It construes both emotions and their forms of regulation within the context of interpersonal interaction (Gordon, 1989; Harré, 1986a; Lewis & Michalson, 1983; Saarni, 1999). This is why it is sometimes called the coconstructivist paradigm (see Figure 2.4). However, why is it necessary to broaden the perspective yet again?

The human genetic endowment also includes an ability that was unavailable at prior stages of evolution: the ability to produce culture, to rearrange nature to fit one’s goals, and to do this with artifacts like tools and signs developed by human beings themselves and handed down from generation to generation as a cultural inheritance. Human culture has thus evolved into a second external “memory store” that is not genetic but “inherited” through learning (Cole, 1996; Leontiev, 1981; Valsiner, 2003; Vygotsky, 1931/1997; see also Lorenz, 1977).

This memory store does not just contain technical artifacts and procedures for dealing with the natural world, but also social artifacts and procedures that regulate human interaction through a system of norms and values (Matsumoto, 2000). These cultural meaning systems also include experiences regarding the significance and effectiveness of single emotion forms, emotion functions, and coping actions, as well as rules regarding their context-specific appropriateness. These rules refer not only to the regulation of interpersonal relations but also to intrapersonal action regulation. On the one hand, these cultural meaning systems
exist as daily emotional practice in the form of mimetically coded systems of meaning as found in, for example, conventions and religious or spiritual practices (Donald, 1993; Raeithel, 1994; see Section 3.3), and recently also in (pseudo) scientific mental health practices. On the other hand, they exist as verbally coded knowledge in the form of everyday sayings, myths, moral imperatives, or recently also in (pseudo)scientific lifestyle guides. These systems of meaning are more or less accurate reconstructions of experienced emotional practice. They help individuals to reflect on their emotions—to recognize causes, effects, and consequences—and thereby intervene voluntarily in their own emotional action regulation.

These external resources of human development also open up a new dimension for emotional development: the cultural dimension. From this perspective, the cultural context no longer just seems to be a condition to which the “natural”
functions and forms of emotions adapt themselves. It is far more the case that culture also provides scripts and patterns of meaning regarding which emotions have to be discriminated on the basis of which forms of expression, and which means of regulation are available and appropriate. These are passed on and accumulated from generation to generation. The cultural context is the distal condition that permits individual variety and variability in the forms and functions of emotions and provides a qualitatively new kind of emotion regulation, namely, a symbol-mediated one that each child first has to integrate into his or her personal system of meaning.

This results in a perspective that may initially seem paradoxical: Something so deeply personal and intrapsychological as emotions has a cultural origin. In human beings, we are confronted with the phenomenon that the evolved forms and functions of emotions and the mechanisms for regulating them do not have their origins in the biological inheritance of the individual from which they evolve through maturation, but in the cultural heritage, in the verbally and mimetically handed down systems of meaning that each individual has to take and transform into something personal and intrapsychological.

2.4.2. Empirical Findings

Averill and Nunley (1992) have used culture-historical studies to illustrate how constitutive rules that have social origins and functions determine what persons understand by emotions such as “love” or “anger” and, subsequently, let guide their actions. These are accompanied by rules about which causes of emotions, forms of expression, and coping actions are culturally appropriate—rules that may change with the social context. The authors illustrate this by plotting the sociohistorical development of the constitutive rules of romantic love from the Middle Ages to the present day.

A great number of further studies present detailed descriptions of how culture-specific patterns of emotion can be distinguished even in daily social life (see Briggs, 1970; Lutz, 1986). They can be interpreted appropriately only when the specific cultural meaning context is taken into account. It then becomes possible to make correspondingly meaningful predictions of individual action (see Harré, 1986a; Harré & Parrott, 1996; Ratner, 2000; Trommsdorff & Friedlmeier, 1999).

Coping actions are not linked or determined automatically by the induced emotion, but by the more complex social and cultural context that gives rise to the emotion. Various studies have shown culture-specific preferences for different coping actions as a function of, for example, cultural variations in self-concept (e.g., Frijda, Markam, Sato, & Wiers, 1995; Kitayama & Markus, 1994).

An important issue here is how culture can impact on emotional development. Social anxiety (shyness) provides a good example of this: Longitudinal studies in the United States confirm that social anxiety at preschool age is related to
behavioral inhibition—a biologically determined characteristic—and shows a high intraindividual stability across the years at school measured in terms of low social contacts, low self-assertion, and a negative self-image (Kagan, Reznick, & Snidman, 1987). An analogue study in China with behaviorally inhibited children who went on to become socially anxious revealed a completely different pattern of development (Chen, Rubin, & Li, 1995). These children developed a positive self-image, had numerous social contacts, and also gave positive ratings on their relationships to others.

These marked differences can only be explained through reference to the sociocultural context. Whereas western childrearers (parents, teachers) respond negatively to anxious behavior and view social anxiety as a problem because of the high value placed on self-confidence and self-assertion, Chinese childrearers rate shy behavior positively because it has no negative effect on the peer group and it makes children easier to manage as a group. Childrearers even encourage shyness and view it as a sign of competence because such children are achievement-oriented and academically successful. As a result, these children also gain recognition from their peers. These findings are an example of how one and the same emotional aspect in early childhood can take a completely different path of development as a function of the sociocultural context.

This calls for the formulation of theories in cultural psychology stating which emotion functions and forms along with which coping actions are available to the members of a culture, and whether they are assigned a positive or negative social value.

Such an endeavor focuses attention on how these socially and culturally mediated patterns of emotion are inculcated in the process of socialization. Transmission from person to person is possible only when communicable signs are used. Generally, research has focused on language here and the rules, myths, and theories expressed in it along with the structures of meaning that language creates through narratives. The handed-down narratives that transmit a content, an observation, and a response seem to play a crucial role in this (Harré, 1986a; Harré & Parrott, 1996; Heelas, 1986; Wierzbicka, 1999).

2.4.3. Discussion

When trying to confirm the cultural relativity of emotions, research taking a coconstructivist orientation concentrated initially on documenting the emotion-related idiosyncrasies of different cultures. The aim was to demonstrate that the emotion-related universals assumed in structuralist research are untenable by proving that each interpretation of an emotion has culture-specific meanings that are not present in other cultures (see, e.g., Goddard, 1997, on the term *surprise* in English; Morsbach & Tyler, 1986, on the term *amae* in Japanese; Wierzbicka, 1998, on the term *Angst* in German). At times, this radical context dependence went so far as to reject all general regularity and accept only a cultural relativism.
However, just because the emotional development of the individual occurs in a social and cultural context does not mean that it is no longer possible to derive generalizations. As already stressed in the analysis of the properties of dynamic systems, it is impossible to describe the concrete and unique outcome of development in general categories, because dynamic systems become increasingly individualized through their interaction with their life contexts. However, what can be described in general statements is the underlying developmental mechanisms that enable a child to transform the culture-specific expressions and idiosyncrasies of each emotion into personal emotions and coping actions, and, in this way, develop his or her individuality.

Culture-relativist approaches generally limit themselves to viewing language and the systems of meaning conveyed by language as marking and articulating the emergence of cultural differences. For example, Wierzbicka (1999) has tried to show that English-language emotion terms such as anxiety, anger, or joy—which are so self-explanatory for western emotion researchers—do not describe universal emotion states but vary across cultures. They cannot be translated directly into other languages: Sometimes, comparable terms are lacking; sometimes, they have other, additional connotations. Emotional universals can be ascertained only by developing a semantic metacode (known as Natural Semantic Metalanguage, NSM) whose signified meaning can be found in all languages. Then, one can examine which emotional appraisal patterns can be expressed with such a universal metacode. These patterns, according to Wierzbicka (1999), are then truly universal.

As obvious as it may seem to assume different language-based meaning systems to be the cause for cultural differences to emerge, there are two inherent difficulties with such an assumption: Verbal systems of meaning have to have something that they are applied to—something that must be there for them to describe in the first place. Furthermore, the regulation processes that supposedly channel undesired emotions and amplify desired ones have to be applied to something undesired or something desired that is not itself a cultural product. These are the emotion forms that a person displays (see also Lyon, 1995). The question is: What is the status of these emotion forms?

The second difficulty relates to the first: Attributions of meaning can only begin to be conveyed verbally when children start to acquire language in the second year of life. What happens during the first year of life? What about the emotion forms displayed then? It is impossible for them to be formed through verbal mediation processes.

### 2.4.4. Conclusions for an Integrative Approach

According to the sociocultural perspective, emotions are not exclusively person-specific experiences but also are mainly shaped by sociocultural conditions. In the process of enculturation, persons transform the emotion and regulation patterns
given in their culture into something personal. Although a number of cross-cultural studies have demonstrated the cultural variation in emotional reactions, feelings, and so forth, they have also revealed cross-cultural universals (see, for summaries, Matsumoto, 2001; Mesquita et al., 1997; Mesquita & Frijda, 1992; Ratner, 1999). Emotions do not just have the function of an “inner” adaptation, that is, an adjustment between context and person in line with current motives and concerns. They also call for an “external” adaptation. There are culture-specific expectations regarding how, when, and where emotions are experienced, expressed, and regulated. In the extreme case, this may lead the external appraisal of a person’s emotional response to be viewed as functional in one cultural context but dysfunctional in another—as the example of social anxiety shows (Chen et al., 1995).

Most studies on the relation between culture and emotion have focused on adults and neglected the developmental aspect of cultural differences (Matsumoto, 2000; Mesquita et al., 1997; see also Friedlmeier, 2005a, 2005b; Friedlmeier & Trommsdorff, 2002). There is still no complete analysis of the mechanisms through which emotions can adopt culture-specific forms and functions.

In this book, we want to propose a model that is based on the following ideas: Within a given sociocultural context, meaning given to an emotion is reflected in its verbal label. But meaning also already adheres to the preverbal expression forms of an emotion—indeed from its verbally defined meaning. As a result, emotion forms (particularly emotional expression) already function as mediators between social and biological life (see Lyon, 1994, 1995), and do this as an autonomous mimetic meaning system that permits a cultural transmission before and alongside any verbally mediated transmission. Donald (1993) calls this “mimetic culture” (see also Raeithel, 1994). This transmission starts at birth, because expressive reactions serve as communication signs in the interaction between caregiver and child from the first day onward.

We have to ask how these reciprocal transmissions function. The sociocultural paradigm has also focused on only one direction, namely, on how individuals acquire the rules of their culture, and paid little attention to the opposite direction, namely, how individuals modify existing rules through their actions and are even able to implement new ones. The latter question is particularly significant for open societies in which rules change rapidly.

When determining developmental mechanisms, the sociocultural perspective focuses on the mediation of cultural patterns and thereby the role of socialization and childrearing. When searching for developmental mechanisms, one major aspect is to analyze the interaction between children and their socialization partners. This has to take account of the fact that they exert a mutual influence on each other, or to use Fogel’s term, a coregulation (Fogel, 1993). This would suggest that it is worth going back to contextualist theories when addressing these issues, because they include the social context as an essential feature of development. Examples
of this can be found in the work of Sroufe (1996) or Campos et al. (1996) (see also Saarni et al., 1998).

Now that we have subjected the central paradigms of emotion research to a critical analysis, we can go on to integrate the main conclusions into the integrative approach of our own model. The internalization model of emotional development is the subject of the next chapter.
Chapter 3

THE INTERNALIZATION MODEL OF EMOTIONAL DEVELOPMENT

This chapter presents a model of emotional development that tries to integrate each of the conclusions drawn in the previous chapter when discussing the four emotion paradigms. We understand emotions as functional psychological systems within an individual’s whole activity system. Their function is to regulate those aspects of actions that have to do with satisfying motives and concerns.

Emotion as a functional psychological system. In Section 3.1, we shall start off by describing emotions in terms of their regulatory function and their systemic components: the appraisal system, the motor system, the body regulation system, and the feeling system.

Second, we shall then go on to present the interplay between these four components in the form of a modified feedback model. This will discriminate a basic state, in which the feeling system processes real feedback from the motor and body regulation systems, from an advanced state, in which the feeling system can also process purely mental representations of this feedback. One central assumption in our model is that the mental processing of body feedback emerges during ontogenesis through the internalization of motor and body regulation processes. This is why we call it an internalization model of emotional development.

Third, we shall discuss the arguments and empirical findings that both support and contradict such a developmental feedback conception in psychology.

Finally, we shall specify the conditions under which, on the one hand, body feedback is necessary, and, on the other hand, an internalization of body feedback becomes possible. We hypothesize that one condition for internalization is for body feedback to be used exclusively as a sign within intrapersonal action regulation. Unlike instrumental reactions, signs can change their form without losing
their function; and, unlike interpersonal action regulation, intrapersonal action regulation is possible on a purely mental level.

Before expressive and body reactions can become internalized, they have to take on an intrapersonal sign function. In the following, we shall look at the conditions that make such an internalization possible during ontogenesis.

*From inter- to intrapersonal action regulation.* We consider the first central condition of internalization to be the emergence of intrapersonal out of interpersonal action regulation (see Section 3.2). Interpersonal action regulation between infant and caregiver comes first in ontogenesis. Expressive reactions serve as a central interface, and they do this as expression signs mediating the interpersonal action regulation between infant and caregiver. Intrapersonal action regulation emerges only from this interpersonal action regulation at the age of 3–6 years.

The transformation of expressive reactions into signs. We consider the second condition of internalization to be the culture-specific transformation of expressive reactions into signs that can also be used symbolically. This means to become able to use expression signs to signalize an emotion that is not actually felt. Expression signs do not just become an object of subjective feeling through body feedback. They are also an object of cultural symbol formation and are passed on from generation to generation through social interaction (see Section 3.3). Indeed, only a small portion of the many-faceted and complex system of human expression signs is made up of innate expressive reactions. The majority are culturally evolved as a perceivable expression of a cultural differentiation of emotion qualities. Culture enters emotional development through the internally felt feedback on expression signs and the cultural differentiation of emotion qualities—and this is a process that starts well before the verbal labeling of emotions and their embedment in verbal meaning systems.

These developmental conditions show that expression signs are exceptionally significant for the internalization process. As a result, we shall concentrate on analyzing these and devote less attention to the development of body reactions.

*Levels of regulation.* The regulation of human activity is not just composed of action regulation mediated by emotions, as already mentioned when discussing the different levels of processing in the functionalist emotion paradigm in Section 2.2.5. Instead, human emotional regulation is integrated into a hierarchy of three further levels of regulation that emerge during ontogenesis and interact with emotional regulation in a variety of ways.

The major issue is then how the emotional regulation level is integrated with the other levels of regulation in human activity, and what effects this integration has, in turn, on emotional action regulation. This issue has been studied intensively under the heading of “emotion regulation” as an active modifying of one’s own emotions (see Campos *et al.*, 1989; Campos, Mumme, Kermoian, & Campos, 1994; Thompson, 1990). In Section 3.4, we shall describe the four levels of regulation and sketch how the emotional regulation level is integrated into them.
3.1. EMOTION AS A FUNCTIONAL PSYCHOLOGICAL SYSTEM

If human activity is described as a sequence of actions, an action can be described as a behavior directed toward a goal. Even at its outset, the outcome of such an action is already represented as a more or less vague notion that guides the action toward completion. However, the ability to form such notions of goals and to transform them into actions is not something that occurs automatically. It emerges in a long-drawn ontogenetic learning process in which the attainment of goals through actions is tried, tested, and increasingly optimized. For example, a sequence of consecutive learning experiences is needed before children can attain the goal of eating with a knife and fork by themselves.

Emotions play a major role in this optimization of goal attainment as well as in the selection of goals. They evaluate how own action goals, outcomes, and consequences and their situational context relate to the degree to which one’s own concerns are satisfied, and move toward this satisfaction by initiating suitable coping actions (see Frijda, 1986, pp. 465–466). Initially, we define a concern only as a desirable state that a person strives to attain, and we do not assign it a specific motive or demand in advance that it should be conscious or deliberate. In sum, emotions regulate the concern-relevant aspects of an individual’s actions. As we shall show below, this is an extremely complex function in human action regulation.

3.1.1. THE COMPONENTS OF AN EMOTION SYSTEM

The function of an emotion described above is hard to specify as a discrete material entity that could be located in a certain area of the brain such as the amygdala or identified with a specific behavior such as a smile. It is better to view an emotion as a functional psychological system involving the synchronic interplay of several subsystems. One could outline an emotion—in line with the dynamic systems paradigm—as a self-organizing system (see Scherer, 2000) containing the following four subsystems:

1. The appraisal system. This subsystem appraizes one’s own action goals, outcomes, and consequences as well as their situational contexts in relation to one’s own concerns. The (real or imagined) actions and their context are compared with expectations regarding the (real or imagined) outcomes and consequences of one’s actions formed on the basis of life experiences. Then, their concern-relevant aspects are evaluated (see Sroufe, 1996, pp. 55–60). For example, the unexpected blocking of an anticipated action goal triggers frustration, because the goal blockage also blocks the intended concern satisfaction.

The appraisal process has to be distinguished from, first of all, a reflex-like evaluation process (Scherer, 1994). In a reflex, a specific stimulus configuration, for which the organism possesses specialized perceptual detectors, is coupled
CHAPTER 3

directly with an equally specific adaptive reaction. The ability to perceive this stimulus configuration is already a kind of innate appraisal process, but no relation is constructed between the stimulus and personal expectations (Sroufe, 1996, p. 60). For example, a sudden, deafening pistol shot triggers the startle reaction and not the emotion of surprise. At best, this emotion might emerge as a consequence of the startle reaction should, for example, the origins of the shot remain unclear (Ekman, Friesen, & Simons, 1985).

Second, the emotional appraisal process has to be distinguished from a consciously enacted evaluation of the concern-relevant relation between an individual and the environment. In the latter, the prior emotional appraisal process is reconstructed post hoc with the help of conceptual knowledge (Lazarus, 1991, p. 144). Only human beings are capable of performing such reflected evaluation, and this ability starts to emerge only during the 3- to 6-year age range (see Section 4.3). Emotional appraisal processes, in contrast, are already attributed to mammals and to apes in particular (see Panksepp, 1998; Schneider & Dittrich, 1990).

2. The motor system. This subsystem does not just contain expressive processes (e.g., crying for help) but also different kinds of action readiness (e.g., wanting to flee) (see Frijda, 1986). We subsume both types of reaction under the heading “expressive reactions.” These initiate the actual coping action that should transform the current person–environment relation in a way that serves one’s concerns (e.g., running away in order to vacate the danger zone). Hence, an emotion is characterized by a decoupling of expressive reaction and coping action, whereby the type of coping action may depend on the person’s learning experiences and/or the situational context. This enables an emotion to regulate actions more flexibly than a reflex (Scherer, 1994).

The coping action does not necessarily have to be performed by the person himself or herself. It can also be performed “vicariously” by somebody else (e.g., another person removes the threat). Hence, an expressive reaction can be directed toward either oneself or another person (see Section 3.2).

Moreover, there are two different ways of initiating a coping action (Frijda, 1986, pp. 11–15): An instrumental initiation leads to a direct change in the person–environment relation. For example, (anxious) withdrawal in the face of danger removes the individual from the immediate danger zone. A communicative initiation leads to an indirect change in the person–environment relation by giving the other person a signal (e.g., by calling for help) that should induce this other to carry out the concern-serving action (see Section 3.3).

Unlike Scherer (2001), we subsume expressive processes and kinds of action readiness into one subsystem, because they can not only adopt the same instrumental and communicative initiation functions but also be performed voluntarily.

3. Body regulation system. This subsystem covers all body reactions triggered by the autonomic nervous system and by endocrinological processes that are, to
a major extent, involuntary. It adjusts physiological functions such as heart rate or breathing to changes in the person–environment relation. For example, fear is experienced as a threat to physical integrity. The functionality of the body regulation system can be seen in, for example, the autonomic reaction of sweating to make the skin less vulnerable to injury and the draining of blood from the limbs to reduce any subsequent blood loss (see Collier, 1985). However, how far the triggered body reactions actually are adaptive to all emotional events is a question of cultural and ontogenetical development.

4. *The feeling system.* This subsystem covers the internally perceivable sensations accompanying an emotion. When unexpectedly confronted with a savage dog baring its teeth, one feels a cold sweat, goose pimples, and bated breath. In this book, we label these sensations “feeling” to discriminate them from the concept of “emotion” that we view as characterizing the interplay between all four subsystems. In contrast to expressive and body reactions, feeling cannot be measured objectively. Because it exists for the actor alone, it is accessible only through introspection. By its very definition, this imposes a restriction on the usual objective criteria of scientific research. Nonetheless, this in no way implies that feeling is not a real phenomenon.

Feeling takes on a monitoring function within the regulation of emotions by switching the focus of attention to the cause of an emotion. Expressive reactions are transformed into situationally adapted coping actions. And, if necessary, readjustments are made to the entire process of the person–environment transformation (see Clore, 1994; Scherer, 1990).

It is this continuous monitoring process that allows the emotion to function without hitch as a system. This is because not only the constellation of actions and contexts triggering the emotion but also the coping actions to satisfy concerns are (with very few exceptions) not present at birth but are first learned during ontogenesis. Hence, each emotion episode requires a new and simultaneous representation in the feeling system of the following three phenomena: the cause for the emotion, the expressive and body reactions triggered, and the available coping actions. Only then can they be coordinated with each other in the best possible way.

*Neural systems and their relevance.* All four emotional subsystems have their roots in the brain (see Damasio, 1994; Rolls, 1999; Scherer, 2001): The appraisal system and the feeling system have specific cortical and subcortical locations; the motor system has its roots in the motor cortex and the somatic nervous system; the roots of the body regulation system lie in the autonomic nervous system and subcortical structures regulating endocrinological processes. The fact that all nervous systems are involved in emotional episodes underlines how “powerful” emotions are. They embrace the entire person.
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However, we assume that brain processes and mental processes belong to different system levels, and are not interchangeable. Brain processes are the material substrate pointing to an object located outside the brain processes themselves to which a life-relevant meaning is assigned. Accordingly, psychic processes can be conceived as semiotic processes. Hence, the emotion “fear” cannot be equated with neural processes in the amygdala. Instead, it signals a threat of danger that the person endeavors to evade, perhaps through flight. This is why the subjectively experienced feeling of fear is not identical with the brain processes that carry the feeling, because the brain processes in themselves are only electrical and chemical processes possessing no intrinsic meaning (see Mausfeld, 2003).

The following analogies may clarify this important distinction: The meaning of a word cannot be assessed by analyzing its auditory tone, and a software algorithm cannot be understood by measuring electrical impulses in a microprocessor. Here as well, it is necessary to analyze the function and meaning of the tone or the electrical impulse.

Therefore, an analysis of neural arousal patterns is meaningful only when combined with an analysis of their psychological sign function. Nonetheless, the analysis of brain processes can provide valuable confirmation of how far postulated psychological functions and processing steps can also be traced in the brain’s structure, and which consequences damage to specific brain structures may have for psychological action regulation (Damasio, 1994).

3.1.2. THE INTERACTION OF THE COMPONENTS AS A FEEDBACK MODEL

Now that we have identified four subsystems as major components of an emotion, the next question is how these subsystems interact with each other so that an emotion emerges. A number of different concepts of these interactive relations have been proposed (see Bischof, 1989; Panksepp, 1998; Chapter 2). We shall start with one broadly accepted concept possessing a strong common-sense plausibility: a parallel-processing model (see Panksepp, 1998, p. 33).

A parallel-processing model. Such a model starts in the appraisal system. This goes on to trigger emotion-specific reactions in the other three subsystems simultaneously and in parallel. The latter do not draw on each other reciprocally as input or output. The subjectively experienced quality of feeling is viewed exclusively as a direct product of the appraisal processes in the central nervous system (see Figure 3.1). Rolls (1999, p. 73) took this approach when he wrote: “The orbitofrontal cortex and amygdala, and brain structures that receive connections from them, are likely places where neuronal activity is directly related to the felt emotion.” Lazarus (1991, p. 210) has also proposed a parallel processing model.
The internalization model. In the following, we shall work out what distinguishes our internalization model from the parallel processing model. The additional assumption in the internalization model that emotional feeling is subject to development makes it necessary to distinguish between a basic state and an advanced state.

1. The basic state: Feeling as internal feedback on real expressive and body reactions. The internalization model draws on Damasio’s theory of somatic markers (Damasio, 1994). This posits that feeling sensations do not emerge parallel to expressive and body reactions, but as their product. The concern-related appraisal of the person–environment relation in the appraisal system triggers an emotion-specific action readiness in the motor subsystem and in the body regulation subsystem that serves as input for the feeling system in the form of an internal feedback loop. One becomes aware of one’s autonomic processes through interoceptive sensations and of one’s motoric expression and action impulses through proprioceptive sensations. In the following, we shall label the former bodily sensations; the latter, expressive sensations. These represent the sensory substance (qualia) of subjective feeling. One senses that one’s face is frozen with fear; that one has broken out in a cold sweat and has goose pimples (see also Janke, 1998, 2005b). We view expressive and bodily sensations as necessary indicators for a feeling (see Figure 3.2).

At the same time, expressive and bodily sensations are not sufficient to produce a feeling experience. An orientation toward the cause that has triggered the emotion is lacking. As a rule, the cause of an emotion is represented simultaneously in one’s sensory perception of the (real or imagined) event. The object from which the threat proceeds is present, for example, as the visual image of a growling dog.

Such a temporal correspondence between the representation of a (real or imagined) emotional cause and the representation of emotion-specific expressive
and body reactions is necessary for a complete subjective feeling experience (see Figure 3.2, Path 5). We feel sad because we hear about the death of a loved one, and we simultaneously feel how our eyes begin to water.

The expressive and bodily sensation is in juxtaposition to the perception of the cause of the emotion. The perceived cause becomes marked and colored in an emotionally specific way only through such a sensation. This is why Damasio (1994, pp. 173–174) talks about “somatic markers.”

A perceptual image without such a sensation would be what is called a “cold cognition”—one knows about the sad cause without feeling anything, as in our previous example of the death of a favorite aunt (see Section 2.2.3): Although fully aware that she had lost her much-loved aunt for ever, the individual did not feel sad when telling her boss about it.

An expressive or bodily sensation without the perception of an adequate emotional cause, as scientists have attempted to generate through experimental manipulation of facial expressions (see Manstead, 1988) or adrenaline levels (Maranon, 1924), generally triggers “cold” arousal or “as-if feelings” rather than a “real” feeling. One senses something without knowing exactly what is actually happening
(see, however, Levenson, Ekman, & Friesen, 1990), unless the sensation can be attributed unequivocally to a cause, e.g., explaining the sensation of bodily arousal as caused by thinking of a sad event or by having drunk a lot of coffee or by strong physical effort.

Hence, the feeling emerges out of feedback on real expressive and body reactions. This interaction pattern is the basic and original pattern in ontogenesis. It is found particularly in the early ontogenetic phases of emotional development and in intensive emotions, but not in the first months of life (see Section 4.1.1).

2. Advanced state: Feeling as internal feedback on internalized expressive and body reactions. A description of the later phases of ontogenetic emotional development requires a further assumption that Damasio (1994) also includes in his somatic marker model: the existence of so-called “as-if” emotions. These are emotions with no or hardly any measurable expressive and body reactions, but with which persons still claim to experience a feeling. For example, when Friesen (1972, cited in Fridlund, 1994, p. 289) exposed participants to disgusting pictures, many of them showed no expression of disgust although reporting that they experienced it. Furthermore, persons with spinal cord lesions reported experiencing feelings even though they were no longer able to experience any interoceptive sensations (Chwalisz, Diener, & Gallagher, 1988).

A parallel-processing model has hardly any difficulty in explaining such as-if feelings. It assumes that the motor subsystem and the body regulation subsystem can be “switched off” separately, while the feeling system remains switched on. For a feedback model, in contrast, such as-if feelings are a problem, because expressive and bodily sensations are viewed as necessary criteria for the feeling experience. How can this contradiction be resolved?

We assume that what we call an internalization of expressive and body reactions occurs during the course of emotional development. Under conditions that we shall describe in more detail in Section 3.1.4, this may lead to the disappearance of externally measurable expressive and body reactions, because representations of emotion-specific sensations in the central nervous system are accessed. This enables a person to subjectively experience expressive and bodily sensations without requiring their simultaneous presence as expressive and body reactions that are objectively measurable (see Figure 3.3). A similar idea has been expressed by Malatesta and Haviland (1985, p. 110) when they talk about a “desomatization of the affect” during ontogenesis in which expression signs are replaced by internal representations (see, also, Church, 1982).

Phantom pains are a good example for mental representations of bodily sensations. This term is used when a person experiences pains in a part of the body that has been lost through amputation. Taken objectively, the pain experience cannot be based on a physical feedback signal. However, subjective experience does not
distinguish between a phantom pain and a “true” pain. Both are experienced as real (Melzack, 1989; Ramachandran, 1994).

Studies on the induction of pride and joy in our own laboratory (Upmann, 2000; von Olberg, 1999) have demonstrated that participants subjectively experienced emotion-specific expressive sensations such as smiling, puffing out their chest, and crying out in triumph, although the appropriate expressive reaction could not be perceived by observers (see Section 4.5). Internalization may also be partial: The individual may feel intensive sensations within his or her body, although only weak expressive and body reactions can be measured externally.

Hence, expressive and body reactions do not disappear completely as the parallel-processing model would assume. They tend to become internalized instead. The emotion-specific sensations acquired through experience are stored as mental representations that the appraisal system can activate directly, that is, without having to pass through the “body feedback loop.”

As-if feelings are, nonetheless, a secondary product of ontogenetic development. They should tend to be found more among adolescents and adults (see, for a detailed discussion, Section 4.4.1).

The internalization of emotion-specific expressive and body reactions is a central mechanism of ontogenetic development. It leads to the emergence of a private world of feeling analogue to the private world of thoughts to which others no longer possess direct access. In this sense, emotional development adapts to
the broader ontogenetic developmental trend toward an increasing mentalization of psychological processes already described by Vygotsky (1931/1997).

Therefore, unlike Izard (1977), we do not view such as-if emotions and their precursor forms as a marginal pathological phenomenon, but as an advanced (adult) form of emotion. They permit a more flexible and, above all, a more anticipatory regulation of action in which even distant action goals, which initially exist only on an imaginary level (i.e., only in the world of thoughts), can be evaluated in terms of their concern-serving aspects.

Change of research perspectives. To extend the internalization model of emotional development sketched above and make it accessible to empirical testing, it is necessary to apply a twofold change in perspective in our methodological approach:

1. From an observer to an actor perspective. Particularly when analyzing the feeling system, we consider it necessary to switch perspective from the observer to the actor. It is only then that we can understand how a person may feel bodily and expressive sensations subjectively—from the actor perspective—even when the corresponding expressive and body reactions cannot be measured objectively from an observer perspective.

2. From the perspective of general psychology to that of developmental psychology. Taking the perspective of general psychology tends to result in an exclusive focus on modeling the complete, mature end state of an emotion system and on assessing and selecting single elements of the system only according to their current functionality. Modeling them proceeds from the viewpoint of an “engineer” who is free to design a product “on the drawing board” exclusively in line with current functional concerns. However, every living being is the outcome of a developmental history in which one has to take account of more than the current functionality of the system elements. A number of these system elements are already specified through the phylogenetic and ontogenetic history. These then become the raw material for subsequent phylogenetic and ontogenetic transformation processes (Griffiths, 1997). This makes it more appropriate to take the adaptive historical perspective of a “plant grower” who, when cultivating a new type of plant, always has to proceed from prior forms that are already given. To take another example, the fact that a dolphin has fins can be explained from the perspective that they are functional for living in the sea, but this does not explain why these fins are formed from bone. The only way to explain this is to reconstruct their phylogenetic history.

The claim in general psychology that emotional feedback processes tend to be rather dysfunctional and redundant in adults (see Rolls, 1999, p. 52) ignores both their ontogenetic and their phylogenetic developmental
history. Only a developmental perspective makes it possible to see that these emotional feedback processes in adults that continue to be perceivable only from the actor perspective have been preceded by real feedback processes in infancy and early childhood (which are also perceivable from the observer perspective). This enables a person to continue experiencing the subjective feeling of an emotion as being “the same” all through ontogenesis—as assumed by Izard and Malatesta (1987)—even when the accompanying objective feedback processes have disappeared.

3.1.3. SUPPORT FOR A FEEDBACK MODEL OF FEELING

Looking at the proposed feedback model of feeling from both an actor and a developmental perspective might make it easier to grasp the arguments and empirical support for the adaptivity of a feedback loop. These are sketched below, followed by potential criticisms of our approach and inconsistent empirical findings.

*The phenomenological plausibility of bodily and expressive sensations as feeling signs.* A common practice in emotion research is to tap emotional experience through verbal report. Participants classify the quality of the feeling they are experiencing into emotion categories and quantify its intensity on a set scale.

Although practical and economic, such a procedure has shortcomings from the actor perspective. It only seems as if individuals can assign a subjective feeling to an emotion category unequivocally and rate its intensity directly. However, in fact, such verbal reports are abstractions that fail to tap the phenomena in which we are really interested.

The analysis of emotional expression from an observer perspective provides a good analogy for this shortcoming. This is a comparable situation in which observers are unable to deliver an unequivocal categorical judgment on an emotion, as a number of researchers (e.g., Ekman & Friesen, 1982) have already pointed out. Observers do not “see” an emotion such as joy when they look at a person’s face. They only see certain expressive movements. They interpret these on the basis of their learned experiences as a person’s emotional expression sign in a given context, for example, as a smile after receiving a present. They use this to deduce the emotion experienced, in this case, joy.

Hence, subjective verbal reports based on emotion categories are also only verbal signs representing the feeling experienced. This makes them abstractions in which the actor highlights certain signs from the perception as a whole while ignoring others. Such a methodological approach neglects one decisive issue: What special sign embedded in the entirety of the sensations experienced does a person refer to when judging an emotion from the actor perspective? What could these special signs be?

They might be specific patterns of bodily sensations, perceived from the actor perspective as intero- and proprioceptive feedback from expressive and body
reactions. This actor perspective makes the idea of somatic markers phenomenologically plausible, as already indicated by James (1890/1950): If we were to remove all subjectively felt expressive and bodily sensations from experience, “in what remains, there will be a cold, undifferentiated state of purely intellectual perception” (p. 451).

I cannot at all imagine what sort of emotion of fright will remain in our consciousness if sensations are eliminated that are connected with increased heart rate, rapid breathing, trembling of the lips, weakness of the extremities, with “goose bumps” and with excitation of the internal organs. (pp. 451–452)

This premise can be tested by asking persons not only to classify their feeling experience in emotion categories but also to report which signs have guided their choice. However, only few research has addressed this issue. Recently, Janke (1998, 2003, 2005a, b) began to study systematically how children acquire knowledge about bodily sensations and action readineses co-occuring with emotional states like anxiety, sadness, anger, and happiness. (see Section 4.5).

Emotions as an involuntary experience. Body-related feedback processes are also consistent with the subjective impression that emotional experience is not something that is generated actively as when one purposefully generates a mental image of, for instance, a favorite vacation resort, but is experienced passively as something that just happens to one. Emotional experience is abrupt (see Ulich & Mayring, 1992, p. 56), and obliges persons to re-act to it involuntarily (Frijda, 1986, p. 240). This is also expressed in Frijda’s description of the subjective representation of emotion-specific action readiness as a “persistent tendency to act in given ways or of persistent absence of such tendency” (Frijda, 1986, p. 232).

Subjectively, persons do not experience the act of appraisal, that is, the internal process of constructing an emotion in the brain. They only experience the action readiness resulting from this appraisal. They are exposed to a feeling in the form of expressive and bodily sensations, and, as such, it evokes the impression that something real has happened and not that something has been constructed subjectively.

Likewise, persons experience the external reality surrounding them in the form of visual, auditory, and tactile sensations as something that happens to them involuntarily, as something that really occurs, and not as something constructed in the mind. As with feelings, visual and auditory sensations do not allow the represented objects to appear where they originate, namely, in the brain, but where they are to be found in the external world (see Leont’ev, 1978).

Damage to somatosensory brain regions impairs the experience of feelings. The somatosensory regions in the right hemisphere of the brain are assumed to form the neurological basis for expressive and body feedback (Damasio, 1994). The somatosensory system is responsible not just for the external sensations of touch, temperature, and pain, but also for internal body sensations such as the
interoceptive feedback on autonomic and endocrinological processes, the proprioceptive feedback on the position of joints and muscles, and, hence, also expressive reactions. In this sense, there is a real feedback loop linking the body and expressive reactions triggered by an emotion to their accompanying subjective sensations. As a result, persons always have an up-to-date image of the state of their body to which they can refer in need or which encroaches on them when experiencing an intensive emotion.

If the expressive and body representations located in the somatosensory brain regions form the basis of the feeling experience, then it would be plausible for damage to these brain regions to also impair the experience of current feelings. Research seems to back this up (Anderson & Tranel, 1989; Damasio, 1994, pp. 62–70; Woodward & Armstrong, 1979). Patients with damage to their somatosensory brain regions due to strokes or tumors exhibit completely incorrect judgments of subjective well-being. Despite severe physical impairments, they rate their subjective well-being as normal or even good. This disturbance is also labeled anosognosia—the inability to recognize that one has a sensory or motor impairment. Damage to the somatosensory brain regions seems to disrupt access to the current proprioceptive representation of changes in body state. The patient is left with only the memory of an earlier body state when the somatosensory brain regions and other body functions were still intact (Damasio, 1994, pp. 153–154). This would suggest that these brain regions form the neurological basis for subjective feeling.

The adaptivity of real feedback from the body. If feelings are to make a good job of their monitoring function in action regulation, it is necessary to have a subjective representation of the action readiness that is actually present in the body and not just that triggered by the appraisal system (Damasio, 1994, pp. 143–146, 155–160). On the one hand, while an emotional action readiness is being triggered, it is continuously confronted with an existing body state that can facilitate or impede it. For example, the triggering of anger and the accompanying full body arousal necessitate a further action readiness when the body becomes weakened or exhausted. On the other hand, when an initiated action readiness has been implemented, there are real consequences that have to be represented subjectively before a situationally appropriate and effective fine-tuning can be performed. In the feedback loop through the body, the impact of this body state on the emotional action readiness would be represented directly in feeling.

Evolution of the feeling system: Feedback processes as a more parsimonious construction. The evolution of a feedback loop as a vehicle of subjective feeling seems to be more parsimonious than the evolution of a completely new kind of feeling system working in parallel (see Panksepp, 1998, pp. 56–57). In phylogenetic terms, the expressive reactions of the body regulation system and the motor system are older than those of the appraisal and feeling systems. The former two systems
served and continue to serve other regulation functions such as the continuous maintenance of body homeostasis and within-species communication.

To evolve a feeling system based on a feedback system, these existing systems would require only one additional function providing an internal representation of expressive and body reactions as sensations in the form of proprioceptive and interoceptive feedback. These representations can then serve as a sensory basis for the subjective feeling, and fulfill their monitoring function by being able to fine-tune the emotion-specific expressive and body reactions in line with situational conditions.

This is more parsimonious than evolving a completely new kind of parallel-processing feeling system that would have to develop in addition to the proprioceptive and interoceptive sensations. The latter would require bodily sensations if the emotion-specific expressive and body reactions were to be fine-tuned in response to changing conditions. It would also require transformation rules between the subjective feeling and the expressive and body reactions so that the feeling could fine-tune these reactions. A feedback system is far less demanding.

**Developmental perspective:** Expressive sensations from interpersonal regulation can also be used for intrapersonal regulation. The proposed feedback model also seems to be a more parsimonious and simultaneously multiadaptive construct from the ontogenetic perspective on development.

For example, babies are obliged to use expressive reactions to signalize their current state of need satisfaction to their caregivers. Caregivers can then satisfy these needs vicariously. It is only when they are older that children start to be able to look after themselves.

In a feedback concept, the emotional expression signs designed to impress others, such as pouting or whining, are represented proprioceptively as expressive sensations. These sensations, however, can be used just as effectively in intrapersonal regulation. Persons are impressed by their own sensations, and this leads them to perform their own coping actions to satisfy their concerns.

Hence, from the actor’s perspective, the intrapersonal regulation of expression uses the same subjective feeling signs as interpersonal regulation (see Table 3.1). The feedback process allows expressive sensations to arise in both cases. This makes it simple to switch between inter- and intrapersonal regulation without the need for any additional rules governing the transformation between external expression and internal feeling (see, for more detail, Section 3.3.2).

Expression and impression draw on the same expressive sensations. A feedback model can also explain how facial mimicry functions. Facial mimicry is the (more or less) involuntary imitation of the expressive reactions of another person (Bavelas, Black, Lemery, & Mullett, 1987). Through body feedback, the imitated expression triggers expressive sensations corresponding to the state of feeling in the individual being imitated. This can trigger a transmission of feeling
**TABLE 3.1. Components of Emotions from Observer versus Actor Perspective**

<table>
<thead>
<tr>
<th>Components of emotions</th>
<th>Observer perspective (perception by others)</th>
<th>Actor perspective (self-perception)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor system</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expression</td>
<td>• Facial, e.g., smiling</td>
<td>Proprioceptive sensations from own expression reactions</td>
</tr>
<tr>
<td></td>
<td>• Gestures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Body postures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Touch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Spatial behavior</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Tone of voice</td>
<td></td>
</tr>
<tr>
<td>Action readiness</td>
<td>Observable action impulse such as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Hugging (for joy)</td>
<td>Hearing one’s own voice</td>
</tr>
<tr>
<td></td>
<td>• Fleeing (for fear)</td>
<td></td>
</tr>
<tr>
<td>Body regulation system</td>
<td>Observable of measurable such as</td>
<td>Interoceptive sensations such as</td>
</tr>
<tr>
<td></td>
<td>• Changes in breathing rate</td>
<td>• Shortness of breath</td>
</tr>
<tr>
<td></td>
<td>• Blushing</td>
<td>• Blood rushing to the head</td>
</tr>
<tr>
<td></td>
<td>• Skin conductance</td>
<td>• Breaking out in a sweat</td>
</tr>
<tr>
<td></td>
<td>• Pulse rate</td>
<td>• Pounding heart</td>
</tr>
<tr>
<td>Situational context</td>
<td>Observation of a fitting cause</td>
<td>Perception of a fitting cause</td>
</tr>
<tr>
<td>Conceptual level</td>
<td>Categorical classification of observations to an emotion quality and intensity by the observer</td>
<td>Categorical classification of observations to an emotion quality and intensity by the actor</td>
</tr>
</tbody>
</table>

*Research on the feedback hypothesis focuses essentially on information in the gray fields. Testing the extended version of the feedback hypothesis with as-if feelings requires the additional assessment of expression and body sensations (white fields in right-hand column). This is the only way to test whether expression and body sensations that are not accompanied by observable expression and body sensations are also capable of being felt.*

known as emotional contagion, particularly in infants and young children (Hatfield, Cacioppo, & Rapson, 1994; Saarni *et al.*, 1998).

When a mimicry process does not just lead to an imitation of the expression but also to an adoption of the perceptual perspective of the imitated individual, the expressive sensations can also be assigned to an appropriate emotional cause. This, in turn, can set the emotion-specific appraisal process in motion, triggering further expressive and body reactions. In this way, the mimicry process can trigger and synchronize all emotional subsystems successively. The imitator then becomes “infected” completely by the emotion of the imitated individual. However, when the imitator is aware that the feeling triggered is actually a response to the other individual’s emotion, contagion is transformed into empathy (Friedlmeier, 2003).

We assume that this twofold ability to apply expressive sensations—in inter- and intrapersonal action regulation as well as in expression and impression formation—is a central selection mechanism that has made, and continues
to make, a phylogenetic, culture-historical, and also ontogenetic contribution to the emergence and differentiation of emotion qualities (see, for more detail, Section 4.2.1).

**Objections to a feedback concept.** The idea that body feedback might serve as a foundation for the subjective feeling of an emotion has a long research tradition going back to James’ first publication in 1884. Since then, several theoretical and empirical objections have been made to such a feedback conception of feeling. As a result, it was repeatedly put aside under the impression that it had been refuted empirically—however, only to reemerge in a modified form in light of new research findings (see Meyer *et al.*, 1993; Reisenzein, 1993). The body feedback idea experienced its most recent renaissance in the 1990s with the work of Damasio (1994) to which our research also refers (see also LeDoux, 1996). Damasio’s version tries to dispel the majority of objections at least on the theoretical level. These objections focus on two narrow concepts: that in the James and Lange theory (Lange & James, 1922/1967) positing purely visceral feedback processes as a foundation of feeling as well as that in facial feedback theory (Izard, 1977; Tomkins, 1962) positing purely facial feedback processes. Therefore, in the following, we shall sketch the current state of the broader field of research that is relevant for our extended feedback model.

A first objection is that autonomic and facial feedback is too undifferentiated. The same autonomic and physical changes occur in completely different emotional and nonemotional states. Grossmann (1967), however, has pointed out that this criticism would hold only if it could be shown that the specific total pattern of autonomic (and facial) changes were to remain unchanged across different emotions and were also to occur in nonemotional situations. Up to now, no such proof has been given.

There are also numerous empirical studies that seem to support the premise of emotion-specific patterns of arousal in the autonomic nervous system (Ekman, Levenson, & Friesen, 1983; Stemmler, 1989; see, for an overview, Levenson, 1988). Moreover, we now also know that injections of certain gastric peptides can rapidly evoke emotional episodes. For instance, intravenous administration of cholecystokinin can elicit panic attacks (Harro, Vasar, Koszycki, & Bradwejn, 1995) that are transported to the brain by the blood. Hence, the induction of different emotions in the brain could produce different patterns of hormone secretion, leading, in turn, to the emergence of differences in the patterns of chemical feedback that could trigger an emotion-specific feeling.

Furthermore, like Damasio (1994), we assume that body feedback is not just composed of feedback from the autonomic nervous system or facial muscles, but is made up of the entire pattern of interoceptive and proprioceptive sensations from expressive and body reactions. This permits immeasurably differentiated body feedback. Nonetheless, this modification to the theory has to be handled
with caution: It harbors the risk of immunizing the feedback thesis against any negative proof, because such complex patterns would be extremely difficult to either confirm or reject empirically.

A second objection states that feelings are experienced without accompanying body reactions. Persons with paraplegia, who have lesions in the spinal nerves connecting the brain to the body due to accidents, were asked to report how they experience feelings. The first studies, by Hohmann (1966), showed that the breadth of experience seemed to be diminished in patients with very severe injury. However, when Chwalisz et al. (1988) also took into account how successfully persons had come to terms with their injury, they found, in contrast, that persons with paraplegia exhibit no impairments to their feelings.

Nonetheless, these studies on persons with paraplegia reveal some methodological weaknesses: For example, the flow of information between brain and body is never disrupted completely in this population: The nerves conveying feedback from the face remain intact along with the flow of hormones between brain and body, so that some degree of body feedback is retained. Furthermore, these studies assessed the feelings of these persons only retrospectively and categorically. They were asked to recall emotion episodes since their paraplegia and report only the type of feeling and its intensity. This does not reveal how far they actually experienced the interoceptive and proprioceptive sensations that are supposed to form the basis of feeling (see Table 3.1).

If studies were to produce results showing that participants who are currently going through an emotion feel none of these sensations, but nonetheless report experiencing the particular feeling, then this would be particularly damaging to an extended feedback theory. However, were persons with paraplegia to feel sensations that they should not be able to feel in reality owing to the lesions to their spinal cords, this would support the existence of so-called mental experience signs (as-if feelings). These are the signs that we view as an advanced form of feeling in which the brain draws on mental representations of the particular emotion-specific body feedback. To the best of our knowledge, no such studies have been published up to now.

The objection to facial feedback theory takes the same direction: It seems to be possible to experience a feeling without any accompanying facial expressions. In a series of studies, Fridlund (1994) induced emotions in noncommunicative situations (mostly through recall techniques). Participants reported experiencing a feeling, even though they did not exhibit any expression reactions at the time. Fridlund interpreted this as indicating that expression serves an exclusively communicative function, and is thereby processed and controlled independently from feeling experience. This would contradict a feedback concept.

However, these findings do not contradict the existence of mental expression signs. Like the research on paraplegia, these studies also assessed only the
categorical quality and intensity of feeling and did not ask participants about possible expression sensations (see Table 3.1).

The existence of mental expression signs would be refuted if participants were to experience a feeling without simultaneously experiencing expression sensations. We have examined this issue in our laboratory (Upmann, 2000; von Olberg, 1999): Although participants displayed no expressive reactions while experiencing their feeling, they reported experiencing expression sensations that they used as personal indicators for their feeling (see, for more detail, Section 4.5.1). This supports the existence of the mental feedback processes that we have assumed in line with Damasio (1994).

Finally, a third objection to a feedback concept states that the artificial evocation of the visceral and facial changes that are typical for an emotion does not lead to the emergence of the feeling itself.

Most studies in this field have used injections of adrenalin, a hormone that is also secreted during emotional arousal. Maranon (1924) observed the reactions of 210 persons who had been injected with varying doses of adrenalin. Most (about 70%) reported body sensations like those accompanying strong emotions—however as a “cold” state of arousal. The rest, in contrast, reported experiencing an authentic feeling, mostly anger or sadness; and if sadness, then accompanied by additional body reactions such as crying and sobbing. Some participants even recalled an annoying or sad event. When specifically asked to recall sad events after the adrenalin injection, the proportion of those with authentic feeling experiences increased. However, the study also showed that the unspecific arousal elicited by an adrenalin injection could not be transformed into any feeling at will. Although Schachter and Singer (1962) had assumed this in their two-factor theory, it proved to be unfounded in further research (see Reisenzein, 1983). Here as well, it should be noted that the single negative feelings seem to be composed of more than one body sensation, and not just the sensations of arousal elicited by adrenalin.

Numerous experiments have also manipulated facial expression (see, for summaries, Izard, 1990; Manstead, 1988; McIntosh, 1996; Soussignan, 2002). In general, these studies have shown that although such manipulations may impact on the intensity of the feeling—congruent facial expression strengthens the intensity of the feeling; incongruent facial expression weakens it—they have no impact on its quality. The studies show that facial expression feedback alone cannot elicit the experience of a feeling.

However, it should be taken into account that these studies manipulated only single components of the emotion-specific feedback pattern. Participants may well have used other sensations to estimate the quality of their feeling. Furthermore, these studies also only tapped the categorical quality and intensity of the feeling, and did not ask about the interoceptive and proprioceptive
sensations that might provide insight into further subjectively exploited feeling indicators.

Accordingly, the decisive precondition for experiencing a feeling is not so much the real expression and body reactions that can be measured objectively from an observer perspective, but the subjective impression that a person believes to be having from the actor perspective (see Valins, 1966, 1974).

In sum, we find a very differentiated picture of the state of research on the single empirically testable aspects of a feedback concept. It has become clear that one cannot equate subjective expression and body sensations with real measurable expressive and body reactions. One has to distinguish between the two. This opens up the possibility that adults may also draw on mental feeling signs. To prove the existence of such signs, it is not enough to assess the experience of feelings by asking for a categorical feeling judgment. This has to be supplemented with assessments of the subjective expression and body sensations. Only then shall we be able to estimate the comparative significance of real body feedback versus mental body feedback.

3.1.4. THE INTERNALIZATION OF FEEDBACK FROM EXPRESSIVE AND BODY REACTIONS

Like Damasio (1994), we assume that, under particular conditions, mentally stored expressive and bodily sensations are a “natural” product of ontogenetic development. We shall justify this premise by returning to which functions objectively observable expressive and body reactions might serve in an emotional episode. We shall present functions that do not require expressive and body reactions, because mental feedback can substitute real feedback. This substitution can even contribute to making emotional action regulation more effective.

Which emotional regulation functions require expressive and body reactions?

Three functions spring to mind. Expressive and body reactions are necessary:

1. When they are composed of intrinsically instrumental reactions that serve external and internal regulation directly. Examples are when violent anger raises muscle tone in preparation for an attack, or when disgust leads to spitting out something that has a nasty taste.
2. When the emotion should impress another person and induce them to respond in line with one’s concerns. Assume that one individual is offended by another. The offended individual’s expression of anger in the form of balled fists, a harsh voice, and a threatening stance should make the offender withdraw the insult and apologize.
3. When they are perceived predominantly through visual, auditory, and tactile channels rather than through their proprioceptive or interoceptive feedback. Examples are when one touches oneself in a tense situation,
feels that one’s hands are cold and sweaty, and realizes that one is fearful; or when one hears one’s own sigh and realizes one is relieved.

These three functions require real expressive and body reactions. They form the emotional action readiness and transform the person–environment relation in line with one’s concerns.

Which emotional regulation functions do not require expressive and body reactions? The third condition above already takes an intermediate position. In this case, expressive and body reactions serve as signs—but as signs for the person himself or herself and not for others. In many emotion episodes, particularly in adulthood, the expressive and body reactions underlying expressive and bodily sensations possess no externally directed instrumental or communicational function. They are used exclusively for self-communication: The individual receives signals on the currently perceived concern-relevant person–environment relation through the feedback loop, and then proceeds to initiate an appropriate coping action. In this case, the expressive and body reactions serve as signs: not for other persons, but for the self.

For example, you are working with your computer when the system suddenly crashes, abruptly disrupting the work in progress. Your natural reaction is to be frustrated. However, neither taking a threatening stance, nor raising muscle tone, nor giving in to the aggressive impulse to smash up the computer would be intrinsically functional ways of overcoming the disruption. Indeed, giving way to your aggression would certainly be dysfunctional. These reactions can, nonetheless, serve as signs that will focus your attention on the action disruption and mobilize those thoughts and actions that will get the computer working again. In this case, expressive and body reactions have an exclusively sign function.

Conclusions. We have already presented the conclusion from this function analysis as a central assumption in our internalization model: Given that expressive and body reactions take an exclusively intra personal sign function, they, along with their real feedback, can be transformed into mental expressive and bodily sensations. Internalization is the name we have given to this transformation process from an externally perceivable sign form to a mental sign form that continues to exist only in subjective feeling. In this particular case, we can also talk about “mental expression signs” or “mental body sign.” The extent of this internalization may also vary:

1. The objects of the feeling signs, namely, the expressive and body reactions, can only become miniaturized as long as they maintain their effectiveness as regulating signs. The emotion is then characterized by a (more or less) weakened expressive and body reaction, while the emotion-specific breadth of sensations of facial expression, body posture, voice, and action impulses is retained in the feeling. For example, a quiet, internally directed
sigh of self-satisfaction can fulfill the same monitoring function of feeling as a loud shout of triumph.

2. The feeling signs uncouple themselves completely from their objects and continue to “only” represent them. They then become symbols of emotions just like the spoken word can stand as a symbol for its object.

Such an internalization of expressive and body signs can truly be labeled a qualitative change in the forms of emotion. This perspective makes the subjectively felt form of an emotion less arbitrary than first empirical analyses of externally perceivable expressive and body reactions and their correspondence to internally perceivable feeling had seemed to suggest (see Section 2.2.2) (Bermond & Frijda, 1987; Fridlund, 1994; Izard, 1994; Manstead, 1988; McIntosh, 1996).

3.2. FROM INTERPERSONAL TO INTRAPERSONAL REGULATION

According to the internalization model, only real, emotion-specific expressive and body reactions are triggered at the beginning of ontogenesis, because these alone serve instrumental and communicative regulation functions. As ontogenesis progresses, the model assumes that they also start to take on intrapersonal sign functions—enabling them to be transformed into mental expression and body signs. What is the reasoning underlying this assumption?

Most emotion theories proposed in general psychology (e.g., Frijda, 1986; Lazarus, 1991; Scherer, 2001) assume that an emotion regulates the action of the individual experiencing it. The target of the emotion is the individual himself or herself, who then performs an act that serves his or her concerns. Because action regulation is intrapsychological or intrapersonal it can be described as having an intrapersonal regulation function. Generally speaking, this seems to be the case in adults.

Taking a developmental perspective opens up another possibility: In infants, it is obvious that the main function of emotions is to regulate the actions of their caregivers. A cry expressing distress does not lead a baby to engage in any coping actions. Instead, it leads the caregiver to perform the necessary act to satisfy the baby’s need. What is so special about this regulation is that it is directed toward influencing the mind of another individual so that he or she will act to satisfy one’s concerns on one’s behalf. The target of the emotion is another individual. Because action regulation is interpersonal or interpsychological it can be described as having an interpersonal regulation function.

This differentiation into an intra- and an interpersonal function can be applied to every single emotion quality. For example, one’s anger can lead one to merely threaten another individual so that he or she will get out of one’s way (interpersonal regulation). However, it can also lead to an actual assault on the other person so that he or she is forced out of one’s way (intrapersonal regulation). Sadness can
lead one to seek somebody who will console one. However, it can also lead one to cry alone and console oneself.

   From the perspective of developmental psychology, the original dominant form is the interpersonal regulation function. Fogel (1993) uses the term “coregulation,” and Tronick (1989) talks about “mutual regulation” to explain the reciprocal interaction of regulation processes between caregiver and infant. In ontogenesis, the intrapersonal regulation function follows the interpersonal regulation function. As Sroufe (1996, p. 151) puts it:

   In fact, the general course of emotional development may be described as movement from dyadic regulation to self-regulation of emotion. Moreover, dyadic regulation represents a prototype for self-regulation; the roots of individual differences in the self-regulation of emotion lie within the distinctive patterns of dyadic regulation.

   Action regulation changes over the course of development from the complete dependence of the neonate on dyadic (interpersonal) regulation to the (intrapersonal) self-regulation ability of the older child.

   This developmental mechanism can be viewed as just one example of a more general psychological principle governing the development of higher psychological functions. According to Vygotsky (1931/1997), every higher psychological function starts off as a social action, that is, as an interpersonal function, before it then emerges as an individual action, that is, an intrapersonal function:

   For us to call a process “external” means to call it “social.” Every higher mental function was external because it was social before it became an internal, strictly mental function; it was formerly a social relation of two people. The means of acting on oneself is initially a means of acting on others or a means of action of others on the individual. (p. 105)

   The development from inter- to intrapersonal regulation will be discussed in detail in Section 4.3. This mechanism has major consequences for the development of expressive reactions. If emotions essentially possess an interpersonal regulation function at the beginning of ontogenesis, then expressive reactions become the central mediators in childhood action regulation, and they do this in their semiotic function as signs for others. This shifts the focus of analysis to the quality of the expression sign and the ability of caregivers to take heed of the expression signs of children in their care.

3.3. THE TRANSFORMATION OF EXPRESSIVE REACTIONS INTO SIGNS

The emotional expression and impression processes in interpersonal interactions are not based only on innate mechanisms but rather on how these mechanisms are the basis of more complex forms of expressions. In the following, we shall take a
closer look at the premise that the development of expression processes goes hand in hand with that of impression processes: The emergence of differentiated expression signs on the expression side is linked to the emergence of differentiated feeling qualities on the impression side. The culturally produced expression signs stand for concern-relevant person–environment relations, and they impart these relations to the child’s feeling through the feedback mechanism. The culturally mediated development of expression reactions thus becomes the vehicle for a culturally mediated development and regulation of new culture-specific emotion qualities.

Expression is one of four components of an emotion. It does not just contain facial expressions but also the other nonverbal behavior channels: posture and body movement, gestures, tone of voice, eye behavior, personal space, and touch (see Collier, 1985). Expressive reactions are behaviors that establish or enhance, weaken, or break some form of contact with aspects of the environment, or ones that either aim to do this or assist in doing it (see Frijda, 1986, p. 13). Such a process can take two forms:

First, expressive reactions change the relation between the individual and the environment directly. Frijda (1986, p. 11) gives disgust as a prototypical example. This expressive reaction (retching, opening the mouth, pushing out the tongue, wrinkling the nose) reduces contact with distasteful substances and helps to expel them.

Second, expressive reactions change the person–environment relation indirectly by so influencing the behavior of an interaction partner that the latter will modify this relation in a way that serves the former’s concerns. For example, when an infant displays an expression of disgust during feeding, this serves as a signal to the feeder that she does not want any more food and that feeding can stop. This turns the expression into a sign.

The expression signs used by adults are more than just elements of an innate expression system. They are part of an autonomous mimetic sign system (Donald, 1993; Raeithel, 1994). This sign system differs from the verbal sign system because it codifies only the concern-relevant aspects of the person–environment relations in a culture. Nonetheless, as a sign system, human expression signs are related more closely to speech signs than to the expression signs of mammals. The highly differentiated expression systems of chimpanzees and bonobos seem to take an intermediate position (de Waal, 1996, 2000; Ladygina-Kohts, 1935/2002; Plooij, 1984).

Previous emotion theories have not paid enough attention to the sign function of expressions. We view expression signs as being just as important for emotional development as speech signs are for cognitive development, and that major findings from semiotic analyses of speech signs can be transferred to the analysis of expression signs.

We propose that the significance of expressive reactions for emotional development can only be conceptualized adequately when they are analyzed from a semiotic perspective. Expressive reactions function primarily as signs rather than
as instrumental actions. Such a semiotic analysis of expression requires procedures for identifying individual expression signs and uncovering their meaning and function. These could draw on semiotics, the science of signs (Buchler, 1940; Heeschen, 1990; Lang, 1992; Schönrich, 1990; see also Ekman & Friesen, 1969; Trevarthen & Logotheti, 1987). In the following, we shall sketch the basic principles of such a semiotically oriented analysis. Nonetheless, it has to be pointed out that a great deal of theoretical and empirical work is still required before such a sketch can be put into action.

3.3.1. **What Is an Expression Sign (Semantics)?**

An expression sign consists of a sequence of expressive movements that is accessible to objective description. For example, facial expressions can be described with the action units in the Facial Action Coding System (FACS; Ekman & Friesen, 1978). However, it is not something that can be reduced to a description of movement patterns, just like a speech sign cannot be reduced to a sequence of vocal tone patterns. Instead, an expression sign is a functional system in miniature.

*The tripartite structure of an expression sign.* With reference to Peirce (see Buchler, 1940; Trevarthen & Logotheti, 1987), we assume that a sign has a tripartite structure composed of the perceivable form of the sign itself, the object it refers to, and an interpretant that appraises the sign–object relation (see Figure 3.4).

1. **The expressive pattern.** An expression sign is a specific pattern of expression consisting of single or combined elements from the nonverbal behav-

![FIGURE 3.4. The expression expressive pattern as a tripartite relation between expressive pattern, object, and interpretant.](image-url)
ior channels (see above) such as smiling, crying, making a fist, kneeling before somebody, embracing somebody, staring at somebody, and so forth. Actions with objects that have been assigned a symbolic meaning should also be included, for example, the exchange of rings at a marriage ceremony, waving flags at a march. These examples show that if research were restricted to facial expressions alone, it would fail to address the entire spectrum of expression signs.

2. **The object.** The object denotes the phenomenon or content to which the sign refers. Whereas speech signs can refer to the whole universe of real and imagined phenomena, expression signs generally point to “only” two kinds of object: first, the feeling that an individual is currently experiencing; second, the individual’s current action readiness. Which meaning is associated with the two sign–object relations (sign–feeling or sign–action readiness) is something that is first specified by the interpretant.

3. **The interpretant.** Trevarthen and Logotheti (1987, p. 67) apply the term “motive” to Peirce’s term “interpretant.” This is the relatively invariant meaning coupled with the specific sign–object relation in a given culture. It is relatively persistent; that is, although it changes over historical periods, it does not change from situation to situation in the same way as a sign’s pragmatic meaning (see Section 3.3.2). Hence, it can also be written down in a lexicon (see Table 3.2). It performs a semantic meaning analysis—in contrast to the pragmatic meaning analysis (see below). Every expression sign has a different meaning depending on which of its two objects (feeling, action readiness) it refers to. Feeling deals with the concern-relevant evaluation of the current person–environment relation, and can be labeled “relational meaning” (see Lazarus, 1991). The appraisal theories in current research on emotion focus predominantly on this sign–object relation and its meaning (see Scherer, Schorr, & Johnstone, 2001). Action readiness deals with the current action intentions of the individual.* The main discipline addressing this sign–object relation and its meaning is ethology with its analyses of expressive behavior in animals (Leyhausen, 1967a, 1967b) and human beings (Eibl-Eibesfeldt, 1984).

An example should illustrate these two sign–object relations: A small boy is given a toy and smiles. If his current feeling is taken as the object of smiling, then the boy has made a significant step toward attaining his goal (see Lazarus, 1991,

*This does not apply to the signs in sign language for the deaf and dumb. These represent a universal sign system analogue to that of speech and are not restricted to emotional states.

*Note that “intention” in this context refers to the function or “aboutness” of an act (Dennett, 1987), not to the usual psychological definition, that is, a promise or stated purpose. According to this definition, neither humans nor nonhumans have to know what they intend.
TABLE 3.2. Semantics of Selected Facial Expressions

<table>
<thead>
<tr>
<th>Expression sign</th>
<th>Feeling state</th>
<th>Action readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smile</td>
<td>I feel something good now</td>
<td>I want to continue the current action or interaction. I want to join you</td>
</tr>
<tr>
<td>Down-turned mouth</td>
<td>I feel something bad now and I know I can’t do anything</td>
<td>I don’t want to do anything now</td>
</tr>
<tr>
<td>Square mouth with bared teeth</td>
<td>I feel threatened, but I can defend myself</td>
<td>I want to do something bad to you now. I’m ready to attack</td>
</tr>
<tr>
<td>Eyebrows drawn together</td>
<td>I want to do something now, I think I can’t do it and I don’t think it will happen by itself</td>
<td>I want to carry on pursuing my goal</td>
</tr>
<tr>
<td>Raised eyebrows (with/without wide open eyes)</td>
<td>What I can perceive right now is new or unexpected</td>
<td>I want to know more about this</td>
</tr>
<tr>
<td>Wide open eyes with immobile eyebrows</td>
<td>What I perceive is threatening, but I can’t do anything about it</td>
<td>I want to know more about this, but I can’t do anything now</td>
</tr>
</tbody>
</table>

^Adapted from Wierzbicka (1999, Chapter 4).

p. 267): Through being given the present, the boy now possesses something he has wanted. According to Wierzbicka (1999, p. 189), the boy will now express, “I feel something good now.” If the boy’s current action readiness is taken as object, then he wants the situation to persist. He will show the toy to others, inspect it carefully, and play with it (see Table 3.2).

The example also shows how the two objects of an expression sign and their meanings do not just stand side by side without relating to each other, but represent the two functional aspects of an emotion: appraisal and action readiness. Hence, an expression sign does not just represent either a feeling or an action readiness but an emotion.

This simplified analysis should illustrate our idea. A closer analysis of the relation between emotions and expression signs reveals that an emotion is generally not expressed by a single expressive movement, but by a configuration as collected in, for example, EMFACS (Ekman & Friesen, 1978) or MAX (Izard, 1979). Analyses by Scherer (1992b), Smith and Scott (1997), and Wierzbicka (1999) suggest that these configurations of expressions can be broken down into more elementary, semantic expression signs. This makes it possible to reassemble these elementary expression signs to form new meaningful combinations that go far beyond a stereotyped repertoire and disclose a differentiated language of expression (see Section 3.3.4). This component approach to the analysis of expressions seems to be very promising (see also Wierzbicka, 1995).

Furthermore, semantic analyses can draw on findings and methods from the analysis of linguistic meanings, as Wierzbicka (1995, 1999), one of the main
researchers in this field, has stated. For example, they can use concepts like the “semantic invariant,” “polysemy,” or “semantic component.”

**Verbal labels for expression signs.** In the above example of the boy smiling, one might think that the meaning was described in a rather wordy and roundabout way. Why not simplify matters by describing the meaning of smiling as an expression of “joy?” More generally, why not apply simple verbal feeling categories to describe the meaning of expressions?

Despite its strong intuitive plausibility, such an approach fails to produce a solution because it merely replaces an expression sign with a speech sign without providing any precise description of its meaning. We still have to ask what “joyful” might mean. As Wierzbicka (1995) states:

> The meaning of even a relatively simple gesture such as, for example, a handshake or a hug is very complex, and that to be portrayed adequately it has to be portrayed in terms of an ordered set of sentences (comparable to those which explicate the meaning of speech act verbs . . .), not in terms of any short global labels. (p. 209)

**Universality and culture specificity.** In addition, as Wierzbicka (1999) notes, some expression signs such as smiling are culturally universal, whereas speech signs such as “joyful” and the accompanying verbal meaning are generally culture-specific. As a result, one cannot assume that the meaning of a cross-cultural expression sign is exactly identical to the culture-specific meaning of the English word “joy.” Replacing one term with another is no substitute for a semantic analysis.

Hence, to identify cross-cultural and culture-specific expression meanings more clearly when performing semantic analyses, Wierzbicka (1999) proposes the use of a universal metalanguage, a “natural semantic metalanguage.” This metalanguage contains only meanings that can be expressed in all languages. It can be used to prevent connotations of meaning found in one specific speech culture from being accepted all too hastily as universals, as might be the case when English-language terms are used to assign facial expression signs to basic emotions.

Other classification schemes do not proceed from expression signs but from the possible relational meanings or appraisal processes they signalize. One can then test how far distinct appraisal processes can be assigned to identifiable expression signs. This approach, proposed by Scherer (1992b), has received some empirical support from research on facial expression signs (Kaiser & Wehrle, 2001).

In summary, researchers have only just begun to perform a semantic classification of expression signs, and are a long way from a solid body of knowledge like that on speech signs gained through the semantic analysis of language.
3.3.2. **What are Expression Signs for (Pragmatics)?**

It is not enough to perform just a semantic analysis aimed at describing the invariant meaning of the sign–object relation; a pragmatic analysis is also required. The latter focuses on the function; that is, what a sign is used for in a specific communicative context.

The context-specific embedment of a sign—and also its combination with other signs—can modify its meaning and even transform it into its complete opposite. A single sign can have an extremely ambiguous pragmatic meaning. However, the actually intended meaning may be disclosed by the context, unless the individual wishes otherwise and the ambiguity is intentional.

An expression sign can serve a number of pragmatic purposes (or functions), as Kaiser and Wehrle (2001) have demonstrated for facial expressions. Scherer (1992a) proposed that the communicative function of expression signs should be conceived in analogy to speech signs. This approach refers to Bühler’s organon model (Bühler, 1934/1984) in which a sign can be used as a symptom, an appeal, and a symbol.

1. **Symptom function**—feeling and action readiness are communicated. First, an expression sign can be used as a symptom. Individuals use expression signs to communicate their current feeling and action readiness to their interaction partners. For example, a baby’s cry is an expression of his or her current experience of distress. In this example, the expression sign has an inherent “first-person and present-tense” orientation (Wierzbicka, 1999, p. 185). No statement is made about anything external. It is about the individual showing the expression, and about this individual’s current feeling and associated action intention.

2. **Appeal function**—the partner should be induced to act. Ethological research (Leyhausen, 1967a; see also Fridlund, 1994) points out that expression has emerged in the evolution of the species as a means of controlling the behavior of others. Predominantly, it is effective as a social appeal rather than as a symptom of an internal mental state. Accordingly, a sign is used in anticipation of impressing an interaction partner so that he or she will react in an expression-specific way. The appeal function points to the relational nature of expressive behavior (see Frijda, 1986). Without a partner who will be impressed by the sign in a predictable way, no sign would be able to fulfill its function as a sign. It is assumed that the partner is also able to be impressed by the sign. The cries of distress in babies provide an impressive demonstration of the appeal function of expression signs: When parents hear their baby’s cry, the longer they do not respond, the more they will exhibit physiological stress symptoms (Boukydis & Burgess, 1982), and they sense an enormous pressure to give assistance.
Table 3.3. Appeal Function of Selected Facial Expression Signs

<table>
<thead>
<tr>
<th>Expression sign</th>
<th>Appeal function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smile</td>
<td>Let’s play together. Let’s be friends</td>
</tr>
<tr>
<td>Down-turned mouth</td>
<td>Look after me. Make everything good again</td>
</tr>
<tr>
<td>Square mouth with bared teeth</td>
<td>Hold off! Give way or I’ll attack!</td>
</tr>
<tr>
<td>Eyebrows drawn together</td>
<td>Stop blocking my goal</td>
</tr>
<tr>
<td>Raised eyebrows (with/without wide open eyes)</td>
<td>Give me more information</td>
</tr>
<tr>
<td>Wide open eyes with immobile eyebrows</td>
<td>Don’t hurt me, I submit</td>
</tr>
<tr>
<td></td>
<td>Help me out of danger (directed toward trusted person)</td>
</tr>
</tbody>
</table>

Fridlund (1994, p. 129) has compiled a list of the appellative meanings of some classic facial expression signs. However, he fails to distinguish the appeal function (pragmatics) from the action readiness signaled (semantics). Table 3.3 reports the appeal functions of the expression signs described in Table 3.2. Nonetheless, a comprehensive classification of the appellative meanings of expression signs is still not available. In particular, developmental psychology has addressed this as only a marginal issue (see Hinde, 1985; Malatesta & Haviland, 1985; Smith, 1985; Zivin, 1982, 1985).

3. Symbol function—one acts as if one either feels so or is ready for action in such a way. Individuals can also use expression signs merely to suggest to their partner that they are currently experiencing the corresponding feeling or are in the corresponding state of action readiness. In this case, the expression sign takes the place of its object, and serves as its symbol by means of cultural agreement. If, for example, you say thank you for a present with a friendly smile, even though you are really disappointed with it, then you are not using the expression as a symptom of joy but as a symbol. The expression sign then represents a feeling that is not being experienced at the present time—just as a word can represent an object that is not currently present. In the following, we shall use the term “expression symbol” to indicate that an expression sign can also be used in its symbol function.

A preliminary form of this ability to use expression symbolically is also observed in primates (de Waal, 2000; Mitchell, 1993). However, it reaches full development only in human beings. Symbol formation does not just begin with learning to talk, but is already present in the use of expressive reactions as signs. Infants use expressive reactions as sign, for example, when they make pointing gestures or, in social referencing,
when they interpret the facial expression signs of their caregivers already symbolically as social appeals how to deal with their own felt uncertainty about the situation (Klinnert, Emde, Butterfield, & Campos, 1986), well before they use speech signs. This is not just true from an ontogenetic perspective but also from a phylogenetic one, as Donald (1993) pointed out in his reconstruction of the social genesis of anthropoids (see also Raeithel, 1994).

In our opinion, the transformation of expressive reactions into symbolically usable expression signs is the central mechanism permitting not only interpersonal regulation but also, and above all, the internalization of expression signs in intrapersonal regulation. These two aspects will now be described in more detail.

Expression signs in interpersonal regulation. At present, despite detailed analyses of the phenomena of “deception” (Lewis & Saarni, 1993; Sommer, 1992) and “compliance with display rules” (Ekman, 1972; Matsumoto, 1990), the literature on the psychology of emotions has paid insufficient attention to appeal. Hence, a smile when receiving a disappointing present can be interpreted either as deception or as compliance with a cultural display rule (Saarni & von Salisch, 1993). However, considering the appeal function of the symbolically used expression greatly increases the potential that the symbolic use of expression signs opens up for the regulation of social relations. Individuals either engage in deception or comply with a social display rule because they particularly want to invoke a specific effect in their partner. Even though the present is disappointing, you do not want to damage the relationship to the giver by rejecting it.

Research on impression management (see DePaulo, 1991, 1992; Goffman, 1958, 1967; Hochschild, 1990; Laux & Weber, 1993; Mummendey, 1990) deals with the impressions that expression signs make in interpersonal interactions. Moreover, many cultural anthropologists have analyzed the specific symbolism of nonverbal behavior in different cultures (Eibl-Eibesfeldt, 1984; Lee, Matsumoto, Kobayashi, Krupp, Maniatis, & Roberts, 1992; Poyatos, 1988; Wierzbicka, 1995). Vowinckel (1989), for example, has presented a culture-historical sketch of the forms of emotions and their body expression in civilization. However, the importance for emotion research of these analyses, partly performed in other fields of research, is only being recognized gradually.

This all suggests that the human expression system and its use are not a “natural” means of communication that is exclusively applied spontaneously. They are a culturally formed, purposefully applied means of communication designed to shape interpersonal relations. Nonetheless, their symbolic use is certainly intended to have an emotional impact, that is, to appear “spontaneous” and “natural.” Individuals cannot just reach mutual agreement over their concerns with the help of speech signs; they can also reach such agreements with expression signs—without the emotions represented by the expression signs actually having to be felt at the time.
Expression signs in intrapersonal regulation. The ability to use expression signs symbolically represents the second condition for the development of mental expression signs. The first condition is the emergence of intrapersonal from interpersonal action regulation (presented in Section 3.2). Mental expression signs permit “private” feelings that are no longer based on any expressive reactions perceivable for outside observers but are, instead, mental representations of them.

Why is the ability to use expression signs symbolically a necessary condition for internalization? Before one can use a sign in its symbol function, one has to be able to separate the sign from its object, and also to use it to represent the object when the object is not present. This makes the sign, its form, and its effect the focus of attention in the persons involved, and makes it possible to agree on conventions about the sign and introduce new signs for the same object.

Hence, one can translate speech signs into expression signs without changing their communicative content. Likewise, one can translate the communicative content of expression signs into speech signs. Parents invest a lot of effort in teaching their young children to stop whining and gesticulating when they want something, but to express their wishes in words. Accordingly, the function of a sign is not necessarily tied to a specific form. Another sign form can fulfill the same function for a sign user.

In the case of self-regulation, that is, communication with oneself, the form of the sign can undergo a further transformation: A sign no longer has to possess a perceivable quality for an outside observer. It is enough for it to exist with a sufficient lack of ambiguity for the individual alone. Signs have to be represented as discriminable, meaningful subjective sensations. Thus, material signs that are objectively perceivable can turn into mental signs that continue to be only subjectively perceivable.

In the use of speech signs, this can be seen in the transformation of external speech into the internal speech we use to talk to ourselves without others being able to hear (see Diaz & Berk, 1992; Vygotsky, 1934/1987).

We assume that the development of expression signs undergoes an internalization homologous to that in the development of speech signs demonstrated by Vygotsky. Whether expression signs play such a major role as speech signs in intrapersonal regulation is something that has never been studied empirically.

Summary of the pragmatic functions of an expression sign. A sign that directs the attention of the receiver to the sender functions as a symptom. A sign that directs the attention of the receiver to the receiver functions as an appeal, and a sign that directs the attention of the receiver to objects and contents outside the sign situation functions as a symbol. Complex expression signs are characterized by variation, in which one of these three functions is dominant. The expression sign can be used as a symptom for a current feeling because of its dependence on the sender. It possesses appeal character because of the impression formation
it elicits in the receiver, and, in this way, it influences the receiver’s subsequent behavior. Moreover, it can be used as a symbol, because of the classification of the sign to the emotional content that it represents.

3.3.3. How Do New Expression Signs Emerge?

Not just innate expression signs can be used symbolically. It is also possible to create more differentiated and even new expression signs to express and regulate the culturally generated types of person–environment relations that are relevant to personal concerns. Such a culturally determined mimetic system of expression signs becomes possible because the concern-relevant aspects of both universal and culture-specific person–environment relations are codified and “handed on” down to the next generation through culture.*

If we want to explain how expression signs are generated culturally, we have to take a closer look at the relation between the expression sign and its object. This means that we have to examine the form in which the sign is coded. With reference to Peirce (see Buchler, 1940; Trevarthen & Logotheti, 1987), we distinguish between three forms of coding: index, icon, and symbol. Ekman and Friesen (1969) refer to a comparable differentiation in the work of Morris (1946).

**Index.** An index is linked to its object in an instrumental way and serves an instrumental purpose. The instrumental purpose of retching combined with opening one’s mouth, sticking out one’s tongue, and wrinkling one’s nose is to spit out something that tastes bad.

A behavior or body reaction becomes an index when outsiders refer to it as a sign representing the expresser’s action readiness or feeling state, and, if necessary, adjust their own actions to it. For example, parents may interpret their baby’s retching as an index for the experience of disgust, and feel obliged to discontinue feeding.

Other behaviors occurring within the framework of an instrumental act can also become indices for outsiders, for example, the balled fist shortly before throwing a punch as an index for the experience of anger. Likewise, the body reactions in the autonomic system accompanying an emotion, which actually serve to adapt the organism to the action consequences linked to that emotion (see Collier, 1985), could serve as an index if outsiders are able to perceive them (e.g., blushing as an index for shame).

**Icon.** An icon does not have an instrumental relation to its object but an explicitly semiotic one. In other words, it is used for the specific purpose of

*The symbolic use of signs also makes it possible to expand the originally narrow framework of meaning and—analogous to language—apply it to any objects, as demonstrated impressively by formal sign language. The use of speech signs is not a necessary precondition for such a symbolic use of expression signs (Messing, 1999).
communication. An expression icon points to the action readiness of the sender, and its goal is to elicit behaviors in the receiver that correspond to its appeal character.

The similarity between an icon and the meaning it represents indicates how it should be decoded. Many iconic signs are abbreviated or stylized instrumental acts that have lost their original instrumental context, such as a balled fist or the baring of teeth as icons for anger or wrinkling the nose as an icon for disgust.

The phylogenesis of expression signs starts with observers who develop a sensitivity to being impressed by certain indices (Leyhausen, 1967a). Observers (of the same species) then use the perceivable side effects of the sender behavior as an index for the sender’s action readiness and adjust their behavior accordingly. Once such an ability to be impressed by indices has become established, selection processes can start to transform indices into icons. Icons then become optimized signs that facilitate impression management. Huxley (1966) coined the notion of ritualization for this phylogenetic development. We assume that this transformation of indices into icons can also be found in culture-historical and ontogenetic (Fridlund, 1994) development.*

It is conceivable that many iconic expression signs tend to be universal, because their relational meaning is already embodied in the expression sign itself. Just because a sign is not observed in one culture does not make it culture-specific. Its meaning may well be universal, but it is just the one particular culture that does not use it. This could be because it represents a concern-related person–environment relation that either does not occur in that culture or is not accepted by it (see Wierzbicka, 1995). For example, in Europe with its democratic and egalitarian constitutions, one no longer sees people kneeling or prostrating themselves, although these expression signs used to be part of the familiar expression system of European culture during the time of European absolutism. Kneeling and prostration express strong differences in social rank like those found between master and subject but not those between free citizens. However, they are still found in religious practices as an expression of humility before God. Before an expression sign can be labeled culture-specific, it has to be demonstrated that it possesses a different meaning in two separate cultures.

Symbol. For a symbol, the relation between sign and object is arbitrary (Ekman & Friesen, 1969). It is based on convention and does not exploit any similarities between sign and object. Such a sign system is not self-explanatory; its use and its meaning have to be learned specifically.

Regarding their form of coding, speech signs are symbols. They are assigned meaning through convention, and, generally speaking, their tone structure has no

*Darwin (1872) was the first to address this relation with his second phylogenetic “principle of serviceable associated habits.” However, he paid insufficient attention to the appellative function of expression signs (see Griffiths, 1997, pp. 64–69).
similarity to their meaning (except in onomatopoeic words such as “buzz” and “hiss”).

Expression signs can also be found in a symbolically coded form. Examples are the victory sign as a symbol expressing pride and triumph (raised arm, palm facing outward, index and forefinger opened to form a “V,” other fingers and thumb closed) in the United States. Here as well, clear differences can be found: In Australia, this gesture has the same vulgar meaning as the middle-finger gesture in the United States.

To avoid conceptual confusion, it should be pointed out that not only symbols but also icons can serve as symbols in communication. One can smile (expression icon) without being pleased (use as symbol), just like one can show the victory sign (expression symbol) to signal one’s real pride (use as symptom). When children first become aware of the possibility of using signs symbolically, they can generalize their use to further expression signs and to speech signs as well.

3.3.4. How Can Expression Signs be Combined (Syntax)?

The previous sections have already addressed two essential criteria of the human mimetic system: its semantics, referring to the meaning of signs; and its pragmatics, referring to their use. A third criterion, not mentioned so far, refers to the coherence of signs. It deals with the rules by which signs can be combined with each other. In the speech system, this is called syntax. If we want to consider a mimetic system of expression signs, it has to be possible to combine expression signs with each other according to set rules in order to form more complex units of meaning. What could these rules be? Because there has been hardly any research on this topic, the following comments are only provisional in character.

Spoken language possesses a syntax regulating how speech signs are fitted together to form complex meanings. These syntactic rules of speech reflect a syntax of action—not only in a real but also in a figurative sense: Who does what with what, to whom, where, when, and why? However, any generalization of these syntactic rules to expression signs is restricted by the fact that the latter can represent only a specific segment of action, namely, the concern-relevant aspects of the current person–environment relation in the form of an individual’s feeling and action readiness. This simplifies the possible combinations of expression signs to a syntax of relationships in the here and now with a purely predicative character:

1. Not every permissible combination of expression signs results in a meaningful expressive message in the sense that it embodies a concern-relevant relation. This is analogue to the speech system that also permits grammatical combinations of words such as “hard rivers cut red wine” although they have no meaningful content. However, just as speech receivers assume
that an individual will not speak meaningless phrases, expression receivers assume that senders will not send meaningless expressive messages. As a rule, one tries to construct a meaningful message out of an initially incomprehensible one by drawing on the context and one’s prior knowledge (see Hörmann, 1994).

2. Expression signs can be assembled to form complex meanings. These can be not only dynamic in the form of temporally sequential combinations—analogue to phrases in speech—but also structural in the form of a simultaneous combination of several expression signs. These combinations make it possible to modify the meaning of an expression sign by strengthening, weakening, neutralizing, or masking it, and even to create new meanings.

3. Expression signs can codify only a current relation between the expression sender, the trigger for the expression, and the expression receiver. It is not the subject of the expressive message that is codified through expression signs; the expression sender is simultaneously the subject whose emotion should be displayed. The trigger for an expressive message is also not codified through expression signs; it exists as an object to which the expression sign refers in a spatiotemporal gestalt—for example, in the jumping back in fright before a fear-triggering spider. The expression receiver, who should be induced to act by the message, is also not codified by the expression sign; he or she exists as a person toward whom the expression sign is addressed in a spatiotemporal gestalt—for example, in the frightened little boy who clings to his mother’s leg at the sight of a big fat spider. Hence, the trigger for the expression and the expression receiver can conjoin in one and the same person, as, for example, when a threatening stance triggered by the approach of an aggressor is also addressed toward the same as a reaction. Finally, the location and timing of the expressive message are also not codified, because the message always refers to the here and now.

4. The horizontal level on which expression signs are exchanged between sender and receiver has its own meaning that modifies the expression signs used: Exchange on the same level embodies equal status; exchange on different levels unequal status (Wierzbicka, 1995). One example is the combination of the expression sign “smiling” with the expression sign “straightening one’s back” or “hunching one’s back.” The former signals pride, the independent fulfillment of a standard of achievement or a normative standard; the latter, embarrassment and attempted appeasement. Other examples are kissing a person on the cheek, the hand, or the foot—each demonstrate different levels in the expression of respect.

5. The basic unit of expression sender, trigger, sign, and receiver can also be modified and expanded through combinations with other signs:
(a) **Modification of the expression sender.** By drawing on additional verbal or other signs, the expression sender can indicate that the expression sign does not signal his or her current emotion, but a past or future one. The expression sender can also use additional signs to indicate that the expression sign does not represent his or her own emotion but that of another person who is being imitated. However, such a change of subject has to be rendered explicit. It cannot be inferred from the expression sign itself.

(b) **Modification of the expression receiver.** The receiver of the expressive message does not always have to be a real person who is actually present at the time. It can be somebody who is merely imagined; or the message can be directed reflectively toward one’s own person. Moreover, the receiver can also be a symbol for something that cannot be represented in any other way, as in religious feelings. Humility before Christ may be expressed by kneeling or even prostration before the altar. It is also possible that the current interaction partner is not the intended expression receiver. This is also something that needs to be expressed explicitly through verbal or other signs.

In summary, the mimetic system exhibits coherence in the relations between expression signs that seems to follow set combination rules. Nonetheless, research is only just beginning to explore this field.

Human language is a productive system: Using a limited number of words and syntactic rules, it is possible to generate an almost endless number of meanings. Because expressions also form a sign system, one can argue by analogy that the mimetic sign system is also productive owing to its coherence, and that it can express an almost endless number of concern-relevant person–environment relations, that is, emotions, through a limited repertoire of expression signs. Because of this productivity, the development of new culture-specific concerns can lead to an extension of the mimetic system to encompass and express the new concern-relevant person–environment relations they produce. This productivity is found in both culture-historical and ontogenetic development.

### 3.3.5. Summary

Up to now, we have described two essential developmental conditions for the internalization of expression signs. The first condition is the emergence of intrapersonal action regulation from interpersonal action regulation. Ontogenetically, interpersonal regulation between infant and caregiver emerges first. It requires expression signs that can be perceived from the outside. As children grow toward school age, intrapersonal action regulation emerges from this interpersonal action regulation. It is only then, as children begin to regulate
their actions autonomously, that mental expression signs can develop any meaning.

The second condition of internalization is the *culturally determined transformation of expressive reactions into signs* that can also be used symbolically. Expression signs do not just become an object of subjective feeling through body feedback. They also become an object of cultural symbol formation and tradition through social interaction. The mimetic system of expression signs is an autonomous sign system in which innate expression reactions play only a minor role. Most expression signs are constructed culturally as a material expression of the cultural differentiation of emotion qualities representing different concern-relevant person–environment relations. Culture gains entrance into emotional development through the internally felt feedback from expression signs and the cultural differentiation of emotion qualities.

The first condition functions on the level of an emotion-based action regulation. The second condition already functions on the combination of at least two levels of regulation in human activity. A description of the different levels of regulation is outlined below.

### 3.4. LEVELS OF REGULATION

Evolution did not come to a halt after developing a mimetic system of expression signs (Donald, 1993). In general, human beings do not use sign language but spoken language. This has led to the emergence in phylogenetis of a higher level of sign usage: that of speech signs. These permit a new form of action regulation, namely, a volitional action regulation—something that is attributed only to human beings.

Volitional processes do not just provide a way of regulating actions that can serve as an alternative to emotional action regulation. They also make it possible to intervene in emotional action regulation itself. This has been the topic of a wide range of different studies under the heading “emotion regulation” (Bridges & Grolnick, 1995; Campos et al., 1994; Friedlmeier, 1999a, 2005a; Gross, 1999; Thompson, 1990; Underwood, 1997, Walden & Smith, 1997).

At this point, it should be recalled that emotion regulation addresses the regulation of emotions, whereas emotional action regulation (or, in short, emotional regulation) addresses the regulation of actions by means of emotions (in the sense of the action readiness function).

The major issue here is how the level of emotional action regulation is integrated into the other levels for regulating human activity, and how this integration impacts on emotional action regulation itself. We have already addressed this aspect in Section 2.2.5 when discussing the functionalist emotion paradigm and
Human activity has a species-specific structure, and we believe that it involves at least four distinct levels of regulation (levels of processing) (see Figure 3.5):

1. Habitual action regulation
2. Emotional action regulation
3. Volitional action regulation
4. Reflective emotion regulation
All levels are interconnected through diverse feedback loops. We believe this structure to be universal not only in the sense that it can be found in all cultures, but also because it is a species-specific attribute of every human being. Nonetheless, not all four regulation levels are present at birth, but form during the course of ontogenesis through interaction with the cultural environment. The one precondition is for an individual to grow up in a cultural environment providing the developmental conditions necessary for the formation of each regulation level. Only a part of these developmental options are genetically preprogrammed. The majority are culturally formed means of regulation that are tuned to the specific lifestyle of a culture.

In the following, we shall sketch these four regulation levels (levels of processing). We shall show how a specific psychological process can be assigned to each level that uses specific means.

3.4.1. Actions and Volitional Action Regulation

Actions and the volitional regulation accompanying them represent the typical form of activity regulation for human beings that is to be found in no other species. Human activity is made up of a sequence of actions (see Section 3.1), with an action being defined as a process directed toward a goal. From its very onset, the outcome of an action is already represented as a (more or less vague) mental goal image that guides the action toward completion (Leont’ev, 1978; Maasen, Prinz, & Roth, 2003).

This guiding potential of goal images is the outcome of a prolonged ontogenetic learning process during which the attainment of goals through actions has been tried and tested and increasingly refined. Two conditions have to be met before such mental images of a future goal state can be produced: the use of a universal symbol system and the existence of a self-system (Bischof-Köhler, 1998; Holodynski & Oerter, 2002).

1. The use of a universal symbol system. Goal-directed actions require the possession of a categorical representation of the world produced through symbols. Through these symbols, perceived objects and events have acquired a generalized meaning that is independent of an individual’s immediate motives (Leontiev, 1981). For a human being, a hammer remains a tool regardless of whether or not one currently wants to drive a nail into a timber. For a chimpanzee, in contrast, a stone is only a tool when it wants to crack nuts. After satisfying its hunger, it will simply throw the stone away (Boesch & Boesch, 1984). The use of symbol systems makes it possible to anticipate the outcomes of actions and to simulate ways of solving a problem in one’s mind. A manipulation of real objects has been replaced by a
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manipulation of the symbols representing them. This universal symbol system is found in human language.

Nonetheless, the function of symbol manipulation is not just representational but also appellative. Verbal instructions also serve as a means of resolving problems and directing actions. This transition from pure imagination to the attainment of the imagined is marked by a decision, a voluntary resolution, to strive toward the imagined goal. Because this phenomenon is labeled “volition” (Heckhausen, Gollwitzer, & Weinert, 1987; Kuhl, 1996; Maasen et al., 2003), we also call this type of action regulation volitional action regulation, or, in short, volitional regulation. The use of speech signs and other signs as an appeal represents the beginning of volitional action regulation (Luria, 1961).

Just like verbal demands can induce other persons to perform specific actions, speaking to oneself can also function as a call to action. This self-instructing speech has been labeled private and inner speech (see Diaz & Berk, 1992; Vygotsky, 1934/1987).

2. The existence of a self-system. Trying actions out mentally also requires the ability to conceive of one’s self in relation to objects and other persons. On the one hand, an individual has to recognize and experience the self as being actively engaged, as an agent that sets and also attains voluntary goals. The psychological structure representing this integration is the self. On the other hand, a conscious acknowledgment of the conditions in one’s social and physical surroundings often needs to be made when pursuing goals, so that adequate adjustments may be made (see Deci & Ryan, 1986). In particular, goals pursued in conjunction with other persons require a mutual coordination of the objectives, expectations, wishes, and intentions of all parties.

Goals can then be attained in two ways (Heckhausen, 1997; Markus & Kitayama, 1991; Rothbaum, Weisz, & Snyder, 1982): Either one rigorously asserts one’s own goals by actively influencing other persons (at times, also against their will) and the material environment; or one tries to adapt one’s goals more to those of one’s reference group, making them easier to attain and exposing them to less resistance. The way in which such self–environment reference is organized in the social relations between individuals varies from culture to culture (see Chapter 5). Differences in self-concepts and their attendant control beliefs are particularly crucial. Persons can perceive themselves as self-supporting and closed units (independent) or as part of a social group (interdependent). In the latter case, there is a strong identification with important others who are also experienced as being part of the self.

Persons with an independent self-concept emphasize the attainment of self-selected goals for their own purposes. They also try to modify their environment as far as they can to satisfy their own goals (primary control orientation). Persons with an interdependent self-concept place high priority on social goals such as
harmony, acceptance, and recognition within the reference group. Self-selected goals are pursued actively only when they are in accord with the social context (secondary control orientation).

Representations of culture-specific self–environment relationships in the symbol system vary as a function of these differences. They correspond to different forms of interpersonal interaction. In Japanese culture, for example, with its emphasis on interdependent self-concepts, the mutual exchange of presents is a sign of being good neighbors. It is the act of giving rather than the value of the present that is important. In German culture, with its emphasis on independent self-concepts, presents are rarely exchanged between neighbors. Their importance lies less in the act of giving, but more in whether they express the special quality of the receiver, and correspond with his or her particular wishes or preferences, and so forth. These culture-specific self-concepts also have corresponding influences on emotional development and on the emotional action regulation that emerges (see Chapter 5).

3.4.2. Operations and Habitual Action Regulation

Actions do not just have an intentional aspect addressing which goal should be attained, but also an operative aspect addressing how the goal should be attained. This operative aspect does not depend on the goal but on the means with which and the conditions under which the specific goal is to be attained (Leont’ev, 1978). When driving an automobile with a manual gearbox or a motorcycle, one has to change gears by oneself. However, this may require completely different operations, because automobiles require hand-operated gear changes whereas many motorcycles require foot-operated ones.

The triggering of operations does not depend on a voluntary resolution, but is controlled by the perceived conditions. The “means” for carrying out this form of regulation are currently perceived sensory stimuli linked with appropriate adaptive reactions to form stimulus-reaction chains. Once such chains have been learned, the operative aspect of a goal-directed action can run habitually. This makes it possible to change gears while keeping an eye on the road and talking to one’s fellow passenger.

Operations can have different origins. They may be innate reflexes triggered by certain stimuli such as pulling one’s hand back from a hot plate. However, most operations are first formed through learning. These learned sensorimotor coordinations can become so habitual that they are hard to distinguish from reflex-like reactions.

A great deal of human activity regulation among adults consists in a fine-tuned interplay between volitional and habitual regulation. During the course of their development, human beings build up a representation of their world with the help of symbols and act in line with their expectations. Many action sequences do
not need to be controlled volitionally as long as the conditions that actually occur while the action is being performed correspond exactly with the expectations that have been learned. Under these conditions, there is no need for emotions or volitions.

3.4.3. Emotions and Emotional Action Regulation

This description of the volitional and the habitual regulation levels may generate the impression that human actions can generally get by without emotions. Such impressions have led some scientists to classify emotions as superfluous or even as dysfunctional (see, for an overview, Hillmann, 1960). However, this is not the case.

Actions and learned operations are “blind” to an individual’s concerns. Although some actions such as eating food or visiting a friend are related to concerns, an action in itself contains no indications regarding how far it satisfies them in the here and now. Most actions can even be integrated into several concern systems. For example, eating can also satisfy a communicative concern when carried out in a communal setting. Likewise, individuals can imagine a variety of goals and decide that they want to attain them. However, what ensures that different goals do not block each other or even lead to volitional decisions that do not serve one’s concerns? Similarly, the smooth execution of operations does not guarantee the satisfaction of needs per se when one looks beyond the innate protective reflexes that serve to protect the body from injury.

Hence, one question remains crucial for volitional and habitual regulation: From where does an individual gain the certainty that a specific action and operation is relevant to his or her concerns and will satisfy them—and not just in general, but in the here and now of a specific situation? We have assigned this concern-guiding function to the emotions in line with functionalist emotion theories (see Frijda, 1986; Scherer, 2001). This concern-guiding function is something that is also attributed to mammals. However, precisely because human beings possess the potential to attain an endless variety of imagined goals, the differentiation of emotions has developed in parallel in order to permit a concern-related tuning of volitional and habitual regulation.

3.4.4. “Metaactions” and Reflective Emotion Regulation

The analyses so far have assumed that concerns are satisfied through routine actions or through emotionally or volitionally driven ones. These forms of action regulation come up against their limits when a conflict of concerns arises: Examples are when an individual has to decide between satisfying two concerns; when a concern cannot be satisfied at the present time because of situational circumstances; and when satisfying one concern blocks the satisfaction of the other. Our daily lives
provide numerous examples in which the short-term satisfaction of one concern will lead to the long-term impossibility of satisfying the other, and vice versa.

Such cases call for a type of regulation that takes account of these adverse circumstances and thereby opens up a new, namely, a reflective regulation level. It is not directed toward satisfying a concern in the here and now, but toward gaining knowledge about how one regulates one’s concerns. These reflective actions are also called metarepresentations (Bischof-Köhler, 2000, p. 22). They are directed toward bringing into mind how one’s own psychological regulation works. Bischof-Köhler talks about bringing to mind that which is in one’s mind. To the extent that these representations are directed toward bringing into mind the emotional regulation processes, they become the object of emotional knowledge. If they go beyond the function of knowledge representation and take effect in action, they become the object of “emotion regulation” (Campos et al., 1994; Campos, Frankel, & Camras, 2004; Cole et al., 2004; Friedlmeier, 1999b; Gross, 1999; Thompson, 1990; Walden & Smith, 1997).

We call this form of regulation reflective emotion regulation, because phases of deliberation, decision making, and planning are inserted between a goal and its execution. The ability to engage in emotion regulation enables individuals to stop being the helpless victims of their emotions and action readinesses, and to exert an active influence on the effect of their own emotions (see, also, Campos et al., 1989, 2004; Thompson, 1990). In Chapter 1, we claimed that this phenomenon of emotion regulation is essential for human emotional development.

Hence, we discriminate between an emotional action regulation in which emotions trigger and regulate actions that serve our concerns and motives (Lazarus’ [1991, p. 120] problem-focused actions) and a reflective emotion regulation in which the emotion is regulated through action. Both types of regulation are woven together in real-life actions, because emotion regulation can occur not only after an emotion has been triggered but also while and even before it is triggered. In the first case, actions are activated that weaken or strengthen an emotion in accordance with higher level concerns or even replace it with alternative emotions should they serve one’s concerns better. These are the emotion-focused coping actions in the sense of Lazarus (1991, p. 120). Emotion regulation can also occur during an emotion through, for example, a modulation of expression. However, it can also occur before an emotion emerges, when one avoids certain situations so that one does not have to regulate the emotions they trigger. This is the anticipatory motive-oriented planning of one’s own actions.

The dependence on time consciousness. Performing such reflective regulation is linked to further preconditions that go beyond the ability to use signs symbolically and distinguish between a self and an other. It requires time consciousness (Bischof-Köhler, 2000; see also Suddendorf & Corballis, 1997). The child has to be able to reflect on not only immediate but also future concerns with the help of emotions. He or she has to be able to view the self in relation to past, present, and
future, and this requires a symbolic representation of these phenomena. The child must be able to imagine that concerns that cannot be satisfied immediately may be satisfied at a later point in time (and perhaps even under other conditions).

Such a time consciousness develops during the preschool-age phase from 4 to 6 years (see Bischof-Köhler, 2000). This explains why infants may well be capable of exerting a degree of volitional regulation over their action, whereas a reflective concern-coordinating regulation emerges only with the age of 5–6 years—as shown by research on delay of gratification (Mischel, 1971; Patterson & Mischel, 1976). Bischof-Köhler (2000) has also confirmed that time consciousness and delay of gratification correlate.

Reflective regulation is the highest level of regulation. It is only on this level that volitional, emotional, and habitual action regulation are transformed into a coordinated system ensuring not only the satisfaction of immediate concerns but also the functioning of the system of concerns in a temporally coordinated form.

The success of reflective regulation depends on both the strategies and knowledge on how to influence and modify emotions available in the culture and the ontogenetical stage of learning—how far it is tuned to the developing system of personal concerns and the changing conditions of their satisfaction.

A classification of strategies on emotion regulation. The acquisition of strategies for modifying the quality, intensity, duration, and frequency of emotions is a major developmental task. As described in Section 2.2.5, a number of attempts have been made to classify such strategies. In the following, we shall propose a classification that pays more attention to the functionality of these strategies for emotion regulation and their emergence in ontogenesis. Thompson (1990) as well as Bridges and Grolnick (1995) treat interactive or external coping strategies separately from the rest. However, these interactive strategies do not differ from other strategies in terms of their content. If a child seeks assistance in regulating action from his or her caregiver, in other words uses external coping resources, then the caregiver applies one of the other regulation strategies specified above to the child that one can also apply to oneself. He or she distracts the child, consoles him or her, or offers another interpretation of the event. Hence, the only difference is in who applies the strategy to whom: the person to himself or herself (intraper-sonal emotion regulation) or somebody else to the person on the person’s behalf (interpersonal emotion regulation). Hence, all strategies can be applied either intra- or interpersonally.

Furthermore, the single strategies require different levels of processing. For example, attentional and self-calming strategies can be found on a very basal level. Neonates already have reflex-like regulation strategies at their disposal such as turning away from a source of stimulation that is too intensive (Mangelsdorf, Shapiro, & Marzolf, 1995) or sucking to reduce arousal (Blass & Ciaramitaro, 1994). On the other hand, directing attention can be located on a very high level of processing when one volitionally decides with the help of self-instructions to distract oneself...
intentionally until a negative emotion has subsided. Furthermore, the strategies of “(re-)interpreting the causes of an emotion,” “interpreting and influencing internal arousal processes,” and “the anticipated selection of contexts” require symbolic mediation processes. Moreover, the remaining strategies of “directing attention” and “selecting response alternatives” can also only be applied really effectively through a symbolic mediation through, for example, verbal instructions.

Therefore, we consider it to be more appropriate to classify strategies according to two developmental dimensions: the first ascertains who is regulating—the person himself or herself or another person on his or her behalf; the second ascertains whether the strategy is symbolically mediated or not. The table formed by these distinctions provides further possible subgroups (see Table 4.3 in Section 4.3.3).

Our hypothesis is that the ontogenetic development of regulation strategies proceeds from interpersonal to intrapersonal regulation, and that it is only the emergence of a level of representation mediated by (speech) signs that opens up the possibility of applying emotion regulation efficiently and, above all, in anticipation.

This is in line with Scherer’s assumption that emotional reactions on the concept-based level—in our terminology, volitional action regulation—are triggered to a large extent by voluntary actions (Scherer, 2001). However he does not forge a relation to language development and its role in action regulation, although language is the essential medium for communicating, recalling, and using knowledge. Sections 4.2.2 and 4.3.2 will show in greater detail that language is the essential medium for voluntary action regulation.

We have now described the major basic concepts in our internalization model and tried to integrate the conclusions drawn from discussing the existing emotion paradigms in Chapter 2. The model is based on a systemic concept of emotions that views them as dynamic self-regulating systems that represent, in turn, “only” one of at least four levels of regulation in the entire system of human activity. We believe that an analysis of the interplay between these levels of regulation can make a major contribution toward our understanding of emotional action regulation and how it develops. The next chapter will explain this by describing the ontogenesis of emotions and their regulation and then examining their underlying developmental mechanisms.
Chapter 4

ONTOGENESIS OF EMOTIONS AND THEIR REGULATION

The most important trends in development have already been sketched in Chapter 1: (1) During ontogenesis, the corpus of emotions increases in diversity; that is, new emotions emerge. (2) However, they decline in frequency and intensity (of expression). (3) Emotions “desomatize”; in other words, their attendant expressive and body reactions can become invisible to outsiders. (4) Emotions become increasingly accessible to regulation; that is, their intensity, duration, and quality can be modified voluntarily. The idea behind the present chapter is to rank these developmental trends in ontogenetic sequence, to describe the underlying developmental mechanisms, and to present empirical findings that support the assumptions of our internalization model on the course and mechanisms of development.

Emotional action regulation. First of all, and predominantly, this chapter deals with the development of emotional action regulation. We prefer this term to the usual term “development of emotions,” because we want to emphasize that emotions do not develop as closed entities, but only in relation to their psychological function: the motive-related regulation of actions. Hence, our unit of analysis is not the actual emotion, but a compound that could be described as “cause–emotion–action.” This is because an emotion is a psychological system that appraises internal or external, context-related causes in terms of their significance for the satisfaction of personal motives. It triggers expressive and body reactions that are adaptive and emotion-specific. These are perceived subjectively as feelings through body feedback and related to the cause of the emotion. As a result, coping actions are (or can be) triggered that serve an individual’s motives, be this by the individual himself or herself or by an interaction partner (see Sections 3.1 and 3.2).
According to this definition of emotion, it is, strictly speaking, impossible to find any emotions in the neonate; they exhibit only precursor emotions (Sroufe, 1996). Hence, when describing emotional development, the question is how do the precursor emotions in the neonate develop into the variety of functioning emotions in adulthood that exhibit two properties: (1) They can regulate not only the actions of an interaction partner but also one’s own actions in a motive-serving way (function aspect). (2) The corresponding expression signs and body reactions can become internalized so that outsiders no longer perceive them, though still perceived subjectively as conscious feeling (form aspect).

**Reflective emotion regulation.** Secondly, this chapter also deals with the complementary process, namely, the development of the regulation of emotions through actions that we have called *reflective emotion regulation* (see Section 3.4.4). This aspect deals with how individuals acquire the ability to contain or dam undesirable consequences of their emotions and to regulate them in line with their (anticipated) motives and future expectations. This means that they are no longer directly at the mercy of their emotions and their action readinesses (Campos et al., 2004; Cole et al., 2004; Friedlmeier, 1999a; Thompson, 1994; Walden & Smith, 1997).

Verbal and volitional means are particularly appropriate for this emotion regulation. Examples are the anticipation of goals, verbal self-instructions, and voluntary decisions (Kuhl, 1996; Kuhl & Kraska, 1992). The child acquires these means as part of the volitional action regulation (see Section 3.4.1) that originally emerges parallel to emotional action regulation (Bloom, 1993; Luria, 1961). However, this chapter will address only those aspects of the development of *volitional action regulation* that are relevant in the present context.

We believe that reflective emotion regulation and volitional action regulation have to be taken into account in any adequate explanation of the development of the emotions (or of emotional action regulation). Otherwise, it is impossible to explain how individuals learn to master and modify their emotions over the course of ontogenesis, or how the absolute frequency and intensity of emotional episodes can decline in general.

**Phases of development.** Following the internalization model, the development of emotions and their regulation can be broken down into five phases:

The *first phase covers the initial 2 years of life*. In this phase, infants are faced with the task of building up a differentiated repertoire of emotions mediated by expression signs and acquiring a repertoire of coping actions within the framework of interpersonal regulation with their caregivers.

The term interpersonal regulation already marks the process within which this development is embedded. In the neonate, the single components of the emotion system (appraisal, body reaction, expression sign, and feeling) and their contextual embedment (cause, coping action) are present only in precursor forms (Sroufe, 1996). Before they can adopt their advanced form and interrelate as a functioning system, the caregiver has to add those parts that are initially lacking or undeveloped.
Caregivers have to interpret the still unfocused infant expressive and body reactions appropriately, mirror them in their own expression in the form of exaggerated expression signs, and react promptly with coping actions that serve the infant’s motives. It is only then that infant precursor emotions are augmented to form completely functioning motive-serving emotions.

The infant emotion episode accordingly starts off by being distributed between infant and caregiver. We call this distribution of the system components across two persons the interpersonal form of regulation. Together, infant and caregiver are both preadapted to act as a coregulated system. This can be seen in caregivers in the form of intuitive parenting skills (Papoušek & Papoušek, 1987); and in the child, in the form of an innate sensitivity toward temporal, sensory, and spatial contingencies (Gergely & Watson, 1999) as well as the ability to engage in motor mimicry (Meltzoff & Moore, 1988). This all helps to explain why parental sensitivity toward infant behavior is crucial for successful (emotional) development. It enables neonates to develop into infants with differentiated emotions who signal their motives to their caregivers through succinct, emotion-specific expression signs, enabling the latter to react promptly with appropriate motive-serving coping actions.

This emotional action regulation in infants is, nonetheless, still organized interpersonally, because emotions continue to be directed toward the other person. As yet, emotions do not (or only sporadically) enable children to perform motive-serving actions themselves, even when they have already learned such actions. Also with regard to reflective emotion regulation, infants still depend completely on an interpersonal regulation of emotions through their caregivers. They are still unable to control their emotions in line with higher motives and, for example, delay gratification. These tasks continue to be shouldered by caregivers.

In the second phase of development—from about the third to the sixth year of life—children are faced with the task of reducing the comprehensive support from their caregivers and becoming capable of both intrapersonal emotional action regulation and intrapersonal reflective emotion regulation (see Sroufe, 1996; Walden & Smith, 1997). Infants who still require the support of their caregiver in every emotional episode become children who can regulate their actions independently through their emotions and volitions, just as they can, to a certain extent, already influence their emotions through their own will. In this context, we also see the emergence of the self-evaluating emotions of pride, shame, and guilt that tie the actions of the increasingly “self-aware” child to cultural norms and rules. Children no longer always just want to have their motives satisfied by others in the here and now. They learn to coordinate motive satisfaction with their social environment; to comply with cultural norms and rules of social interaction while doing this; and, when necessary, to rank motives according to their importance and to delay or even suppress their gratification.
In the third phase of development—from approximately the sixth year of life onward—the means of psychological regulation (the expression and speech signs) undergo a change in the form in which they are implemented for intrapersonal regulation. With increasing autonomy, children’s expression and speech signs adjust to the new intrapersonal regulation function by becoming internalized: Physical expression and speech signs that can be perceived by outsiders (observer perspective) become mental expression, and speech signs that, in the extreme case, can still be perceived only by the individual alone (actor perspective). Audible taunts and curses become silent ones; a visible smile becomes an inner, micromomentary one; audible speech becomes inner speech. One cannot say that expression and speech signs disappear; they become internalized. A mental level of expression, speech, and action emerges. Children develop “as-if” feelings (Damasio, 1994); that is, feelings that no longer refer to body feedback over real expressive and body reactions but to their somatosensory representations (see Section 3.1.2).

Two conditions have to be met before such internalization can occur: First, the expressive and body reactions do not have an instrumental function but (continue to have) a semiotic regulation function. They serve only as inner signals communicating the triggered emotional action readiness to the individual so that he or she can select appropriate coping actions. Signs can change their form without thereby losing their action-regulating function—something that instrumental reactions cannot do (see Section 3.3.2). Second, the child must be able to distinguish explicitly between subjectively perceivable feeling indicators and real expressive and body reactions. Only then is the child also able to interpret mental expression signs as sufficient indicators of a feeling and be guided by them. Acquiring conceptual knowledge about emotions thus becomes an integral component of emotional development.

Such an internalization of the psychological means of regulation leads to a further optimization of action regulation. It economizes the course of action: Just as one can think an idea more quickly and with greater complexity than one can put it into words (see Vygotsky, 1934/1987), one can feel an emotion more quickly and with greater complexity than one can put it into expressive and body reactions. Furthermore, it permits an optimization of expression control. When one can feel one’s emotions by means of mental expression signs, one can adapt their externally visible expression to culture- and situation-specific affordances without impairing the motive-related content of one’s feeling. These mental expression signs also make it possible to use emotions to “color in” thoughts over future action scenarios and thereby evaluate them in motivational terms.

The fourth phase of development covers adolescence. The task now is no longer just to anticipate and regulate one’s actions and emotions with regard to the present and the near future, but to develop the ability to extend this self-controlling competence into the distant future as well. This means to evaluate one’s actions in the here and now in terms of their consequences for satisfying motives in the
future—and to decide and act accordingly. A classic example is accepting the need to spend more time on learning and less on leisure in the here and now in order to obtain good school-leaving qualifications in the future.

The expression of emotions is adjusted increasingly more finely to the specific interaction partner and context, and emotional events are recognized increasingly clearly as a part of the self. Hence, being able to accept one’s own feelings is important for the development of self-esteem. At the same time, the pressure of socialization increases as the evaluation of emotional reactions by others, particularly by peers whose recognition is so important for adolescents, becomes important for individual development. Because not enough work has been done on the adolescent phase in the internalization model, it is not discussed further in this chapter.

The fifth phase of development encompasses adulthood. Adult emotions and the reflective way in which adults regulate them provide the standards for emotional development. These are the targets for the more or less conscious emotional upbringing of the offspring in a society. Hence, the outcome of emotional development needs to be displayed particularly succinctly in adults if studies on adults are also to be appropriate for testing the hypotheses on advanced emotional action regulation and reflective emotion regulation in the internalization model. We shall test these in the present chapter in terms of the model assumption that expression signs become internalized and a mental representation level of emotional regulation emerges (the so-called as-if feelings).

How far the emotions of adults and their regulation vary from culture to culture, and along with them the focuses of childrearing and socialization processes, will be considered in more detail in Chapter 5. In the present ontogenetic chapter, the standards for our model assumptions are given by adults in western cultures, particularly the Anglo-American and European cultural frames.

As the socioemotional selection theory from Carstensen (1993) as well as the life-course theory of control from Heckhausen and Schulz (1995) suggest, the functional ability of emotional action regulation, and of reflective emotion regulation in particular, is retained until advanced old age, because the sign mediated forms of regulation seem to be independent from processes of physical decline. Nonetheless, they can be impaired through processes of physical degeneration in the brain.

We shall only sketch this phase, because our research focuses on the first to third phases, and, up to now, hardly any studies have addressed emotional development in adulthood (see Carstensen, 1993; Magai & McFadden, 1996).

Structure of the sections. This chapter is divided into five sections that follow the course of ontogenesis. They will give more detailed arguments in favor of the individual assumptions and add empirical support, also in the form of our own studies. After presenting the ontogenetic starting level (Section 4.1), we shall describe the first phase of development involving the formation of a sign mediated
interpersonal regulation between child and caregiver (Section 4.2). This is followed by a description of the second phase involving the emergence of intrapersonal regulation (Section 4.3). Then, we shall sketch the internalization of the mental means of regulation in intrapersonal regulation as the central topic in the third phase (Section 4.4). Finally, we shall take a look at further development in adulthood (Section 4.5).

It has to be pointed out that the following sections present a developmental theory under construction that is not yet finished. They represent an attempt to integrate the conclusions drawn when discussing the emotion paradigms in Chapter 2 into one coherent model. The main goal is to emphasize general and prototypical features in the development of emotions and their regulation in each phase. Because the majority of concepts and findings come from the United States and Europe, this chapter is restricted to western culture. As mentioned above, the cultural perspective will be elaborated in Chapter 5.

4.1. PREADAPTATION OF INFANT AND CAREGIVER

The ontogenetic starting level of emotional development can be viewed as a reciprocal preadaptation of competencies in the neonate and the caregiver adapted to ensure the step-by-step development of the emotion system. We shall not consider intrauterine development here (see Brazelton, 1983). This starting level is the product of phylogenetic development that, in humans, is adapted in favor of a cultural environment. It is also genetically anchored and, finally, monomorphic in the sense that it is a given for all human beings. These two aspects are often equated with the term “innate,” with the attendant conclusion that any competencies not already present at birth must be exclusively learned and hence culturally determined (see Ratner, 2000).

Griffiths (1997, pp. 55–64) presents a detailed discussion on the unacceptability of this simplified duality of “innate” versus “learned.” Even when the complex interactions between genetic endowment and environmental influences have scarcely been explored up to now, prior research does support the conclusion that the psychological processes emerging later in ontogenesis, such as language acquisition or a set of basic emotions, may also have a genetic basis and belong to the universal endowment of each human being. However, their acquisition requires specific experiences and learning inputs that are generally made available to the individual by the species-specific social environment, and their innate species-specific potential is preadapted for this social environment (see Griffiths, 1997).

According to Prechtl (1993), human babies are “physiologically preterm.” In terms of neurophysiological maturity, they are far less developed than the newborns of our closest relatives among the mammals. One consequence of this shortening of intrauterine development is that newborn humans have very retarded and immature
motor abilities (see Thelen, 1984). They are unable to perform the necessary actions to satisfy their own needs. This is why newborn humans are dependent on caregivers who feel obliged to respond to their emotional expression and ensure the satisfaction of their needs.

Babies compensate for this immaturity in motor abilities through a special adaptation to an interpersonal action and emotion regulation made up of innate precursor emotions and sensorimotor competencies. This is augmented by caregivers who are equipped with intuitive parenting skills that are fine-tuned to the competencies of the newborn and permit a progressive development of the infant within the framework of interpersonal regulation. This will be explained in more detail in the next section.

4.1.1. The Emotions of the Neonate

In terms of our systemic definition of emotion (see Section 3.1), strictly speaking, no fully functioning emotions are to be found in the neonates. They possess only the precursor emotions (Sroufe, 1996) that can form the basis for interpersonal regulation to start. These precursor emotions are triggered by absolute physical stimulus thresholds and not by any attribution of meaning (see, however, Soussignan & Schaal, 2005). Expressive and body reactions are still not coordinated with the cause of an emotion and its situational context. In part, they are still reflex-like. For example, Galati and Lavelli (1997) asked adults to view videotapes of neonates in five emotionally different situations (before feeding, forced movement, in mother’s arms, detaching from mother, inoculation). They found that the adults could rate the neonates’ facial expressions correctly only on the global dimensions of activation and valence. They were unable to rate them according to the situation or the specific emotion quality.

Caregivers augment the infant precursor emotions and form functioning emotions that serve motives by interpreting the still unfocused infant expressive and body reactions in a motivationally appropriate way, mirroring them in their own expression in the form of exaggerated expression signs, and reacting promptly with coping actions that serve infant motives. The expressive and body reactions of the infant in interplay with the interpretations, expression signs, and coping actions of the caregiver form a preadapted interpersonal unit.

The precursor emotions distress, disgust, and fright as well as interest and endogenous pleasure can be observed consistently in neonates (see Izard, 1978). The main purpose of the first three precursor emotions is to signalize need-related deficit states or impairments of physical integrity, whereas the main purpose of interest and pleasure is to build up psychological representations of the external and internal environment (Sroufe, 1996).

Distress and crying. Distress is initially an emotion with no specific motive that is triggered by a deficit state, for example, a lack of food, physical integrity
(hypothermia, pain, overstimulation), or external stimulation (body contact, sensory arousal) (Lester, 1984; Papoušek, 1989). The typical expression and body reaction is initial motor unrest followed by an unfocused crying that slowly increases in volume plus a rectangular open mouth with closed eyes. The quality of crying initially contains no indication regarding the cause of the emotion (Lester, 1984; Malatesta, 1981b). For the caregiver, it functions exclusively as a sign. Motor immaturity obliges the infant to draw the caregiver’s attention to his or her need. Accordingly, the caregiver perceives the infant’s crying as a directed appeal for help. It triggers measurable psychophysiological arousal (Boukydis & Burgess, 1982), an urge to seek the cause of the crying and remove it, as well as a number of intuitive actions designed to calm the infant (Papoušek, 1990). Accordingly, an infant’s cries serving as an appeal for help and the caregiver’s feeling of having to respond to this appeal form a preadapted unit.

Disgust and nose wrinkling. Disgust can be triggered by a bitter or an acidic taste (Fox & Davidson, 1984, p. 365; Soussignan & Schaal, 2005; Steiner, 1977; see also Rosenstein & Oster, 1988). The underlying reflex is gagging (Fridlund, 1994). The characteristic expressive reaction is to drop the lower lip, raise the upper lip, and wrinkle or screw up the nose—as elicited in spitting by opening the mouth and sticking out the tongue (see Izard, 1979, p. 73). The intrapersonal function of this expression is instrumental and serves to eject unpleasant foodstuffs. However, caregivers may interpret the expression of disgust as a sign indicating, for example, that they should stop feeding or switch to another foodstuff.

Fright and starting. Fright particularly follows a loss of balance, but also other abrupt and strong stimulus changes such as a sudden noise. Its underlying form is the Moro reflex. Although Prechtl (1993) assigns it no further instrumental function, it does possess a sign function for caregivers. In itself, fright is closer to a reflex in classification (see Ekman et al., 1985). However, it serves as the starting point for the emotion of fear (Sroufe, 1996). If an abrupt or strong stimulus change persists, as in, for example, a sudden dunking in water when bathing, it is joined by characteristic expressive reactions of fear, such as a widening of the eyes as a sign of sympathicotonia, an A-shaped mouth, and clenching fists (Papoušek & Papoušek, 1999, p. 151). Should overstimulation persist, the reaction will shift to crying as a sign for distress.

Interest and focused attention. Interest can be viewed as a motive-specific emotion triggered by the novelty of an external stimulation. It serves the search for contingencies in the perception of the environment. This active exploration behavior is assigned an independent motivational basis, namely, that of curiosity (Hunt, 1965). Here as well, the “novelty” of a stimulation is linked initially to physical stimulus properties, namely, ones that elicit marked sensory contingencies. These particularly include the “speaking” and slowly moving face of a person holding the baby in his or her arms (Langsdorf, Izard, Rayias, & Hembree, 1983). The underlying reflex for interest is the orienting response (see Sokolov, 1963).
Characteristic expressive reactions are a turning toward the source of the stimulus, visual fixation, inhibition of unfocused motor activity, and, at times, an open mouth (Langsdorf et al., 1983). These expressive reactions possess the instrumental function of priming the sensory system to analyze what is new. Their interpersonal semiotic function is to signal receptivity for information intake to the caregiver (Malatesta & Wilson, 1988).

Interest is absolutely crucial for the development of psychological representations of the internal and external environment and for their introduction by caregivers. Sroufe’s tension modulation hypothesis (Sroufe, 1996) presents a model of how interest, pleasure, and distress interact with the help of caregivers to form psychological representations. The model proposes that every processing of novel stimulation generates not only the reactions mentioned above but also a tension (see Berlyne, 1969) that raises muscle tonus to just below the ceiling of tolerable stimulation. Papoušek (1967) reports that operant learning in babies is also accompanied by heightened tension and clenched fists before a stimulus-reaction contingency is formed. Physical agitation and tension signal the threshold of external stimulation to caregivers with the appeal to reduce stimulation before it turns into distress. If, in contrast, the infant can assimilate the stimulation, it leads to relaxation accompanied by a smile.

Pleasure and smiling. Whether neonates already possess the ability to react with the emotion of pleasure is a matter of some controversy. In contrast to the other precursor emotions addressed here, pleasure does not exhibit any coincidence between the typical expression sign for the emotion—the smile—and an externally observable cause. In neonates, smiling occurs during REM sleep (Emde & Koenig, 1969). This led Fogel and Thelen (1987) to conclude that smiling might still possess no function and not yet be associated systematically with motivation states. In contrast, Sroufe’s tension modulation hypothesis (Sroufe, 1996) offers an explanation that can integrate existing theories and findings on smiling and laughing (see Rauh, 1995) into one consistent theory.

According to Sroufe’s model, endogenous smiling is already the outcome of a relaxation reaction marking the completion of a tension–relaxation cycle. In the neonate, however, this cycle is still set in motion by subcortically generated tension. Nonetheless, the relaxation–smile reaction is designed to be triggered by a striving toward the assimilation of external stimulations, and thus to provide an emotional marker for the end of the successful construction of psychological representations (see Kagan, 1971; Sroufe, 1996). Pleasure serves to keep the infant oriented toward the situation to be learned. At the same time, smiling signals to caregivers that the infant is feeling good and that they should allow the situation to continue or even repeat it (see Malatesta & Wilson, 1988). Different positive emotions like pleasure, joy, delight, and pride can be classified as a function of the level of this assimilation and the expression and body reactions accompanying it (Sroufe, 1996, p. 68).
Feeling as an unfocused body sensation. Along with the components of appraisal, expression, and body reaction mentioned above, a complete emotion system also requires the feeling component. However, two problems emerge when trying to ascertain whether neonates can already feel: a methodological one and a content-related one.

The methodological problem is that, by their very definition, feelings cannot be measured objectively, because they are the subjective representation of one’s personal emotional state. Only the actor can report on this, providing he or she possesses the necessary symbolic means of communication. However, such a communication is not identical to the feeling. It is only its subjective reconstruction with the help of signs. Because the neonate (and also the young infant) still lacks command of symbolic means of communication, this methodological approach is not available.

Nonetheless, the internalization model proposes a second indirect way to tap feelings. A feeling is defined as proprioceptive and interoceptive feedback over expression and body reactions (see also the Differential Emotions Theory formulated by Izard & Malatesta, 1987). Therefore, for a neonate to be able to perceive a feeling, the neural afferences of expression and body reactions would have to function already at birth and elicit corresponding feedback sensations in the somatosensory areas of the brain. However, we are unaware of any research findings on this topic.

The content-related problem concerns what is understood precisely by the term “feeling.” We have defined a feeling as becoming subjectively aware of the emotion-specific expression and body sensations directed toward the cause of an emotion (see Section 3.1.2). According to the available findings (see Sroufe, 1996; Stenberg & Campos, 1990), the above-mentioned expression reactions of crying and the first endogenous smiling only swell up and subside slowly, and their focus on the cause of the emotion is only rudimentary (Malatesta, 1981b). Hence, the feeling is probably the visceral and proprioceptive sensations related to the triggered body reaction and expression. This is not the same as a characteristic feeling for adults: a “becoming aware” in the sense of a categorically organized feeling focused on a cause that can be used to monitor the course of the emotion and that allows coping actions to be triggered. As Gergely and Watson (1999) state:

The set of internal (visceral as well as proprioceptive) cues that are activated when being in and expressing an emotion state are, at first, not perceived consciously by the infant, or, at least, are not grouped together categorically in such a manner that they could be perceptually accessed as a distinctive emotion state. (p. 110)

One can imagine this as being analogue to the perception of the external environment: Of course, neonates perceive their external environment, but not as categorically grouped together objects but as a relatively unorganized bundle
of sensory impressions with only a few preformed perceptual contingencies (see Stern, 1992, pp. 74–82). This means that neonates may well have a subjective representation of their emotional state, but only in the form of unfocused body sensations. Section 4.2.1 will describe how these body sensations are transformed into an emotion-specifically organized feeling that is related to a cause.

4.1.2. Sensorimotor Abilities for Engaging in Interpersonal Regulation

The facial expressive reactions for precursor emotions are joined by a number of further facial expressions that babies exhibit predominantly during REM sleep. These show similarities to the prototypical facial expressive reactions of surprise (raised eyebrows), sadness (pouting mouth), and anger (frowning), but are very fleeting. Malatesta and Haviland (1982) ascertained that the facial expressions of 3-month-olds change, on average, every 7 s, and they concluded that infant emotions are very unstable. However, this interpretation is questioned by the finding that these expressive reactions do not covary consistently with external causes of emotions (Camras, 1992). Moreover, the expressions of anger and sadness cannot be distinguished reliably from global distress reactions (Oster, Hegley, & Nagel, 1992). Hence, although these expressions follow an innate motor pattern, they do not yet serve as emotional expression symptoms in the baby’s behavioral organization. They acquire this function only through interpersonal regulation during the course of the first year of life (see Camras, 1992; Fogel & Thelen, 1987; Lewis & Michalson, 1985).

Further sensorimotor abilities in the neonate reveal a special preadaptation for face-to-face interaction with responsive caregivers. For example, a neonate’s field of visual perception starts off by being specialized for human faces: Initially, babies can see clearly only at a distance of 20–25 cm, and they exhibit a preference for face-shaped forms (Umiltá, Simion, & Valenza, 1996) as well as objects that move slowly enough for them to track them (see Brazelton, 1983). Their hearing favors the frequency range of human speech or slightly higher, and their favorite sound pattern is the human voice (Papoušek, 1994).

Sensitivity for contingencies. Babies also possess a special sensitivity for temporal, sensory, and spatial contingencies as well as an active interest in searching for them (Stern, 1992, pp. 66–68). Gergely and Watson (1999) assume babies must have a so-called contingency detection module. Detecting such contingencies in one’s perception of the internal and external environment and exploiting them for one’s own behavioral organization form the elementary building blocks for the many-layered mental representation of the world that the baby builds up successively. Nonetheless, there is controversy over whether sensory contingencies actually need to be “detected” through repeated contingent experience. Indeed, babies prove to be capable of amodal perception. This enables them to translate
input to one sensory modality into another sensory modality and to assign the corresponding sensory impressions to this second modality without having had to experience an actual contingency between the two modalities (Meltzoff, 1981; Meltzoff & Borton, 1979; Stern, 1985).

Motor mimicry. One particular form of this amodal perceptual ability is motor mimicry. Even neonates are able to imitate the facial expressions of their caregivers such as sticking out their tongues or opening their mouths and also their head movements (Meltzoff & Moore, 1988, 1989). Field, Woodson, Greenberg, and Cohen (1982) were even able to demonstrate that 2-day-old neonates can imitate facial expressions for emotions, namely, smiling, frowning, and pursing their lips. Hence, neonates can translate visually perceived motor patterns into the appropriate proprioceptive ones.

Hatfield, Cacioppo, and Rapson (1994) assume that motor mimicry is a primitive mechanism through which individuals can “catch” feelings from their interaction partners without having to be exposed to the “real” cause of an emotion. The mechanism is “primitive” insofar as motor mimicry generally occurs without conscious awareness. Furthermore, it does not need to assume any cognitive processes in the sense of perspective taking, namely, that individuals place themselves in the situation of the other in order to experience the other’s emotion.

We assume that motor mimicry plays a major role in the differentiation of emotions through interpersonal regulation. It makes it possible to synchronize the expression signs transmitted between caregiver and infant with their corresponding proprioceptive body sensations (see also Saarni et al., 1998), and, hence, to assign expression signs to specific emotions.

This ability to engage in motor mimicry corresponds to a complementary ability in caregivers to mirror their babies’ expressive reactions in their own expression, and to use exaggeratedly succinct expression signs in their interaction in order to regulate their babies’ behavior. These aspects will be addressed in more detail in Section 4.2.1.

At the present time, research is still unable to state whether the motor mimicry of emotion-specific expression signs can already trigger the corresponding feelings in the baby, or whether this is initially only a motor imitation that does not lead to an emotional contagion until the corresponding emotions have formed.

The only clear-cut case in which neonates already catch the feeling of others does not seem to be triggered by motor mimicry: When neonates are exposed to the crying of other neonates, they start to cry themselves (Sagi & Hoffman, 1976; Simner, 1971). The crying of other neonates proves to be particularly catching compared with other forms of crying such as the baby’s own cry, that of older infants, or that of a chimpanzee (Martin & Clark, 1982). This trigger specificity would seem to indicate that the crying of other neonates is an unconditioned trigger stimulus for distress crying (see also Thompson, 1987). Although one could imagine that babies would find their own crying particularly easy to imitate
well, they do not do this. Moreover, it seems to be functional to cry particularly intensively when other neonates are crying to ensure that one gets more attention from one’s caregiver than the other neonates do.

**Precursor strategies for regulating emotion.** Precursor strategies of emotion regulation that can be observed at birth are sucking (Blass & Ciaramitaro, 1994) and looking away from an overwhelming source of stimulation (see Mangelsdorf et al., 1995). The latter serves to control arousal when an interesting source of stimulation cannot be assimilated adequately. Both behaviors calm the infant within a limited arousal range. When the strength of internal or external stimuli exceeds this range, interpersonal regulation has to be performed by the caregiver.

### 4.1.3. Intuitive Parenting

The child-nurturing and -rearing activities of parents, or, in general, caregivers, can be viewed as a necessary and development-promoting complement to the still incomplete action regulation of the baby. Caregivers are preadapted for this complementary task. When observing the interaction between babies and parents, Papoušek and Papoušek (1987) found that parents competently perceived important signals from their babies and reacted appropriately, even though they were unable to provide information on their reactions in subsequent questioning. The authors concluded that such interactions represent a biologically determined foundation of parental competence composed of numerous intuitive behaviors.

Such intuitive parenting does not just cover the ability to attend to the baby’s current needs but also an ability to enable babies to experience contingencies both in their interaction with the material environment and in interpersonal emotion regulation. Papoušek and Papoušek (1999) describe three different processes in which parents apply a variety of skills.

**Parents as coregulators of infant emotions.** Parents register the state of their baby and his or her readiness to interact, and they adjust their facial, vocal, and gestural behavior accordingly. For example, they test muscle tone by opening the baby’s mouth or hands. Lax tone indicates that the baby is tired. Parental sensitivity, that is, being able to interpret expressive reactions adequately as feeling indicators and to react promptly with appropriate coping actions, is essential in this process. Such skills also include the direct regulation of infant emotions by maintaining an optimal level of arousal in the infant through appropriate activation or calming.

Infants are generally receptive to distracting coping actions by their caregivers designed to ameliorate crying and physical agitation. Hence, seeing a face, listening to a voice, and having one’s freedom of movement restricted during physical agitation by being taken into the caregiver’s arms and cradled has a calming effect on the baby’s psychological arousal modulation. Vice versa, by performing the same stimulations more intensively, parents can heighten their baby’s arousal.
Parents’ use of emotional expressions to direct infant behavior. In the way they speak and express themselves, parents provide the baby with models and encourage imitative behavior by reacting contingently with positive emotions. Because of the contagious effect of parental expression on feeling, a comparable emotional reaction can be triggered in the baby, so that the emotional expression of the parents serves to reinforce infant behavior. The use of succinct expressive reactions in interpersonal regulation by overexaggerating facial expression or voice modulation in baby talk is a particularly important means of expression that lead to emotional contagion and the transformation of expressive reactions into expressive reactions and conscious feelings. These processes will be discussed in Section 4.2.1.

The role of the infant’s emotional expression to direct parental behavior. Positive feedback signals in response to parental interventions such as visual attention, smiling, quiet cooing, or snuggling up serve as a reward and as a source of positive emotional experiences for the parents and reinforce their competence. By doing everything they can to elicit positive reactions while avoiding and ending negative ones, they focus themselves intuitively on the needs of their baby and encourage his or her learning behavior. This is the way in which the baby’s emotional reactions and intuitive parenting join together in a positive feedback loop.

4.1.4. Summary

Neonates enter the world with a repertoire of emotion‐relevant abilities. They possess a number of emotional expressive reactions that provide a congruent display of their current needs, an interaction‐specific sensorimotor ability (of which motor mimicry is a particularly important aspect), and the ability to engage in contingency formation. However, these basic abilities permit only an extremely limited intrapersonal regulation. Nonetheless, babies are very well equipped for an interpersonal regulation through contact with a social environment that can interpret their expressive reactions appropriately and react with motive‐serving actions.

Inspection of the form of the expressive reactions used by neonates shows clearly that they start off as global, undifferentiated positive or negative reactions that are not directed toward any specific object. In part, they swell up and subside slowly (except fright), and do not yet possess any specific appeal. These unfocused and undifferentiated expressive reactions form the starting point for the further differentiation of the emotion components. One of the tasks of caregivers is to interpret unfocused signs as an appeal, to use their own initiative to ascertain the reason for distress or a smile, to remove the cause of distress, and to repeat or allow to continue the cause of smiling.

Within this process, caregivers do not just interpret infant expressive reactions as personally directed appeals and react to them with appropriate care. They additionally try to maintain the baby at a level of arousal that is optimal for learning. They make it possible for the baby to experience temporal, sensory, and spatial
contingencies that represent the elementary building blocks of psychological representations, and they mirror the infant expressive reactions in their own expression in succinct and prototypical ways so that the baby will also experience contingencies between expression and feeling (see Gergely & Watson, 1999; Stern, 1985). They adapt their communication intuitively to the baby’s perceptual limitations described above by reducing its complexity and making the message so succinct that it can elicit contingent reactions in the baby. The unthinking nature of this impressive array of skills led Papoušek and Papoušek (1987) to talk about intuitive parenting.

4.2. THE EMERGENCE OF SIGN-MEDIATED REGULATION IN INFANCY

4.2.1. THE EMERGENCE OF SIGN-MEDIATED EMOTION SYSTEMS

In the first phase of infant development, children have to master two tasks through interpersonal regulation with their caregivers: (1) to build up differentiated emotion systems mediated by expressive reactions such as frustration, anger, sadness, joy, fear, or embarrassment; and (2) to acquire a repertoire of (coping) actions.

Whereas caregivers still have to complement the neonate’s precursor emotions to form functioning emotions, interpersonal regulation optimizes all emotion components (appraisal, expression, body reaction, and feeling) and their interplay in a way that leads to the emergence of differentiated, sign-mediated emotion systems in infants. These systems enable infants to take over an increasingly equal share of interpersonal regulation while orienting and guiding their caregivers precisely and promptly toward satisfying infants’ motives. Intuitive parenting plays a crucial role in this process.

Nonetheless, infant emotions continue to be focused on the other person. They do not yet (or only sporadically) allow infants to autonomously select and apply previously learned actions to satisfy their motives. Emotional support also continues to be important for them.

In the following, we shall use the internalization model to derive three postulates describing the mechanisms involved in the development of the emotion components.

First Postulate: The Processes That Differentiate the Appraisal and Expression Components are Interdependent

The differentiation of appraisal patterns is interwoven with their corresponding expression and body reactions. These processes are embedded within the interpersonal regulation between caregiver and child. Through sensitive and prompt nurturing, caregivers create contingencies between the elicitors (causes) of an
emotion, their baby’s expression and body reactions, their own interpretations in terms of motives, and their own actions to deal with these motives. This is how the components become integrated into cause-specific, functioning emotion systems.

**Differentiation of appraisal patterns.** Functionally oriented emotion theories consider the development of meaning-dependent appraisal patterns to be the driving force behind the emergence of new emotions (see Barrett & Campos, 1987; Sroufe, 1996; Tangney & Fischer, 1995). In meaning-dependent appraisal patterns, a relation is established between features of the situation and the motive-relevant expectations and interpretations that the individual infant has built up through his or her interactions with the environment (see Sroufe, 1996, pp. 56–57). This transforms the neonate’s precursor emotions (distress, disgust, fright, interest, and endogenous pleasure), triggered by crossing the thresholds of internal or external key stimuli, into “real” appraisal-guided emotions triggered by the personal meaning of the perceived stimulus.

Hence, these functionalistic theories focus on identifying the decisive developmental milestones in the construction of infant meaning structures and testing whether these meanings are accompanied by the emergence of the corresponding emotion in the infant’s repertoire (see Dickson, et al., 1998, pp. 254–255).

One of the first developmental milestones is when babies recognize contingencies in the flow of incoming external stimuli. Generally, this is recognizing the caregiver in face-to-face interaction. Sroufe’s tension modulation hypothesis (Sroufe, 1996) proposes that this recognition is preceded by a phase of effortful assimilation of the incoming stimuli. This increases internal tension and triggers relaxation and a smile at the moment of recognition. It keeps the baby oriented toward the situation and encourages the caregiver to continue or repeat the stimulation. Sroufe describes this emotional state as “true” pleasure. For Sroufe, the onset of social smiling marks the turning point at which it is no longer the stimulus properties themselves that are the essential cause of pleasure, but their meaning for the baby. With increasing experience, the baby also recognizes other contingencies such as the visual and auditory contingency of a ringing bell ball. Its perception and recognition then also generates a tension–relaxation cycle that leads to a smile directed toward the toy.

Hence, functionalistic theories explain the emergence of new emotions exclusively through the formation of contingencies between prior cause, learned meaning structures, and subsequent action. Expression and body reactions are involved only insofar as they are used as indicators for the underlying appraisal pattern. This is because appraisal patterns cannot be observed directly, and they are, by definition, psychological processes (Barrett, 1998). Hence, methodologically speaking, expression and body reactions are conceived exclusively as dependent variables that are caused by the prior appraisal pattern. As a result, they are unable to make any contribution to the differentiation of appraisal.
Differentiation of the expressive reactions. The internalization model, in contrast, assumes that the emergence of the appraisal pattern is linked inseparably to the differentiation of the expression and body reactions. Naturally, in adult emotions, the appraisal process precedes expression and body reactions, and so one can talk about a cause–effect relation. However, when new emotions are emerging, effects tend to be reciprocal. The impact of the baby’s casually displayed expressive reactions on the nurturing behavior of the caregiver can also be the trigger for the formation of a new appraisal pattern.*

This can be illustrated by smiling: Intuitive parenting leads caregivers to seek contact with their baby from the very onset. The first and easiest way to do this is to position oneself so that mutual gaze contact becomes possible. However, caregivers do not simply observe their baby passively, but talk and smile in order to provoke a reaction. Because neonates are also already able to imitate facial expressions (Field et al., 1982), the first smile directed toward the caregiver may well arise as a result of imitation rather than the formation of a contingency. Hence, it may be a smile without any internal tension–relaxation cycle. For caregivers, however, baby’s first smile is an outstanding event. Many mothers report feeling a complete personal and positive bonding with their baby only after intensive eye contact and the beginnings of a smile (Robson & Moss, 1970). As a result, they will mark such events contingently by increasing their own smiling and vocalizations. This establishes ideal conditions for the infant to build up contingencies and initiate the tension–relaxation cycle of pleasure with “real” smiling.

One finding supporting such a bidirectional influence of expressive reactions is that smiling does not emerge as a prompt on–off reaction during the first weeks of life. It starts in the neonate as a gentle lifting of the corner of the mouth that appears only after a delay of about 7 s following the cause and, at times, with eyes closed. It is only in the 3-month-old that it develops into an active grinning with vocalization (cooing) that follows the cause promptly and is directed toward it (Sroufe, 1996, p. 81). Throughout these 3 months, there are countless face-to-face interactions in which caregivers smile at their babies and create opportunities not only for detecting contingencies but also for motor mimicry.

It is particularly expressive reactions that develop rapidly in the first 2 years of life. Not only do new expressive reactions emerge, their dynamics and their reference to a context also become better organized, more focused, and more prompt.

Stenberg and Campos (1990) have depicted a comparably continuous development of expressive reactions for anger in a study of 1-, 4-, and 7-month-old babies whose arms were restrained in order to induce a negative emotional reaction. One-month-olds reacted with a series of undifferentiated negative facial

* Adults may also be confronted with completely new kinds of situation for which no clear appraisal are yet available to be triggered. Then, the appraisal patterns may be a product of the expression and body reactions elicited and the subsequent effects experienced.
expressions before starting to cry. Their gaze was unfocused. In contrast, 4- and 7-month-olds exhibited a clear expression of anger (drawn eyebrows, open rectangular mouth, sometimes narrowed eyes). At the beginning of restraint, their gaze was directed toward the hand or the face of the person restraining them. Hence, they already localized the source of discomfort. Whereas 4-month-olds kept their head directed toward the face or the hand of the person restraining them, 7-month-olds shifted their gaze toward their attendant mothers—a possible call for assistance. Their anger expression had acquired a socially directed appeal character. In another study of 5- to 12-month-olds, Camras, Oster, Campos, Miyake, and Bradshaw (1992) observed that whereas anger expression still took some time to build up in 5-month-olds, 12-month-olds responded promptly to having their arms restrained.

We can summarize the development of expressive reactions as follows: The unfocused, in part, still unorganized expressive reactions of the neonate, which require some time to build up, turn into emotion-specifically organized expressive reactions that are directed toward a cause. These follow the cause promptly, are fine-tuned to their context in terms of timing and focus, are supported by coordinated body reactions, and can purposefully trigger motive-serving coping actions—generally, in the caregiver.

Expression signs as mediators between infant and caregiver. The reciprocal influencing of appraisal patterns and expression reactions is generated by the special context in which infant emotions develop: interpersonal regulation with the caregiver. Fogel (1993) talks explicitly about coregulation, thereby stressing the interdependence of infant and parent behavior.

Babies build up their emotion-specific appraisal patterns not just in a physical but also in a semantic space in which their emotional experiences are mediated by the interpretations of caregivers. Infant expressive reactions play an important role in the emergence of these interpretations—and not just as instrumental adaptation reactions to the physical environment, but also as indexical and iconic signs that appeal to the caregiver (see Section 3.3.3). Caregivers infer their baby’s emotions and intentions through the coincidence of situational features, knowledge of their baby’s character, and his or her current expression and body reactions, and they respond with actions that are coordinated with this interpretation of their baby’s expression. In turn, they infer the success or failure of their interventions from the course of the baby’s expression and body reactions. In attachment research, this coregulation is called (maternal) sensitivity (Ainsworth, Blehar, Waters, & Wall, 1978).

Nonetheless, it is not just any combinations of appraisal pattern and expression sign that can be generated in this process of coregulation between baby and caregiver. To a large extent, expressive reactions are coded iconically; in other words, they are similar to the action readiness triggered by the appraisal pattern (see Section 3.3.3).
For example, the perception of a goal blockage by another person (anger appraisal) requires the following expression and body reaction: the mobilization of those physical powers needed to engage in an aggressive confrontation. This also includes instrumental acts such as scratching and biting that even infants apply to persuade their opponent to stop blocking their goal. Instrumental acts of aggression can then lead to the emergence of iconic threatening gestures that signal a readiness to fight in the hope that one’s opponent may perhaps back down. Hence, raising muscle tone is more appropriate as an anger-specific body reaction than relaxing it. Likewise, iconic expression signs for acts of aggression such as teeth baring or fist clenching are less likely to be misinterpreted in this context than iconic expression signs of appeasement such as smiling or cowering.

We assume that the form in which expression signs are coded as icons and the instrumental usefulness of many body reactions impose limits on how expression signs and appraisal patterns can be combined. Such limits can also explain why some facial expressions are interpreted and used in the same way across different cultures. However, this does not imply that such expression signs have not been learned (or fine-tuned) originally in interpersonal regulation.

Compared with this relationship, that between speech signs and the concepts they describe is obviously arbitrary, because speech signs are coded symbolically; in other words, sign and concept are combined on the basis of convention (see Section 3.3.3)—with the exception of onomatopoeic words such as “bow wow” for a dog.

In interpersonal regulation, caregivers can react to expression signs in their baby (such as crying) that possess an unequivocal emotion-specific anchor. However, they can also make emotion-specific interpretations of expression reactions that are exhibited more or less randomly, and then perform what they consider to be appropriate coping actions—as in the example of the baby’s first smiling reaction (see above). Because the initially accidental expression reactions of the baby make an appeal to the caregiver who then reacts to them contingently, the expression sign can also serve as an incentive for the formation of appropriate emotion-specific appraisal patterns, or both components may reinforce each other in the sense of a positive feedback loop.

If the caregiver then reacts sensitively, promptly, and consistently to the baby’s expression signs, temporal contingencies will emerge from the baby’s perspective between cause, own/other appraisal, own expression, and actions by others. Certain expression signs in this sequence of contingencies then prove to serve motives better than others, thus increasing the probability that they will be used again in a similar situation—and the continuing coregulation process advances to a more developed level.

Affect mirroring and motor mimicry. The special developmental mechanism of coregulation between caregiver and baby mentioned above can now be described in more detail. The interplay between the caregiver’s affect mirroring of
the baby’s expression reactions (Gergely & Watson, 1999) and the baby’s motor mimicry (Field et al., 1982; Meltzoff & Moore, 1988) leads to the emergence of context-coordinated, emotion-specific expression signs and to the differentiation of emotion-specific appraisal patterns.

As mentioned in the previous section, one aspect of intuitive parenting (Papoušek & Papoušek, 1987) is the way in which caregivers contingently mirror the emotional expression signs of their babies in their own expressions. As a rule, they use clear-cut expression signs to represent the emotion they have inferred. This is what makes the way in which parents express themselves to their babies often seem so exaggerated. We assume that this contingent affect mirroring by caregivers combined with the motor mimicry by the baby represents a preadapted system that encourages the formation of emotion-specific expression signs. One should not conceive infant imitation as a one-to-one mirroring of expression, but more as a rudimentary expression imitation that is taken up by sensitive caregivers and shaped into salience through further succinct affect mirroring. This is how both contribute to an emotion-specific synchronization of expression signs in the sense of a self-optimizing system.

A number of studies confirm this relationship: For example, Haviland and Lelwica (1987) showed that the motor mimicry of emotion-specific expression signs observed in neonates by Field et al. (1982) also functions in 2.5-month-old babies. Mothers were asked to display the mimic and vocal expression signs for happiness, sadness, and anger to their babies in a preordained random sequence. Infant expression was analyzed with Izard’s MAX scale (Izard, 1979). Babies showed increased happiness expression in response to happiness expression and increased anger expression in response to anger expression. However, they did not respond to the expression of sadness with sadness expression (drooping mouth, pouting, raised eyebrows), but with clear sucking and mouthing movements. The authors interpreted these infant reactions as being not just motor mimicry but also emotional contagion. Caregivers’ own expression signs seem to have a model function for babies.

Malatesta and Haviland (1982) showed that mothers respond selectively to the emotion-specific expression signs of their 3- or 6-month-old babies when interacting with them, and that they mirror them intuitively in their own expression. In a play episode and in a reunion after a brief separation, mothers reacted to their babies’ expression of interest with increased own expression of interest; to happiness, with increased happiness; and to surprise, with increased surprise—measured, in each case, with Izard’s MAX scale (Izard, 1979). The expression of negative emotions such as sadness and anger was not mirrored so frequently but, nonetheless, more than randomly. For example, anger expression was, in part, mirrored only through knit eyebrows, and negative forms of expression were rapidly replaced with more positive ones. In contrast, both the expression of
distress and simple knit eyebrows were ignored. The authors discussed whether the observed infant expression signs reflected actual emotions in each case or only shifting expression patterns. The latter interpretation was supported by the high fluctuation rate of infant expression that changed approximately every 7–9 s without being classifiable to any available external cause. Hence, infants offered a variety of different expression patterns in face-to-face interaction with their caregivers, mirroring in particular the emotion-specific positive expressions. The finding that those expression signs that were not mirrored by caregivers such as knit brows were less frequent in 6-month-olds compared with 3-month-olds supported the impact of selective affect mirroring. There was also a reduction in the fluctuation of infant expression signs between these age groups. The correlation between infant and maternal expression patterns, in contrast, increased. Hence, it seems that expression signs between caregiver and baby become more coordinated as time goes by.

Malatesta, Grigoryev, Lamb, Albin, and Culver (1986) also confirmed this developmental trend in a longitudinal study of infants at the ages of 2.5, 5, and 7.5 months. Moreover, the pattern of cross-correlations between the first and second measurement waves indicated that contingent maternal mirroring of infant expression signs led to higher infant expressiveness, particularly for positive signs. The pattern of cross-correlations between the second and third waves of measurement even confirmed emotion-specific imitation effects: The emotional expression of happiness and interest revealed imitation effects from mother to baby, whereas the expression of surprise and anger revealed imitation effects from baby to mother.

Furthermore, using a sophisticated experimental design, Legerstee and Varghese (2001) confirmed that 2- to 3-month-olds are able to recognize the contingent affect mirroring of their caregivers and, in response to this, even anticipate such a contingent mirroring from them—as if it were part of a synchronous, bidirectional, face-to-face interaction. They used a face-to-face interaction to split the mothers into a high versus a low affect-mirroring group. Then, the babies interacted with their mothers live over a television screen so that the mothers could respond contingently to the reactions of their babies. In another condition, babies watched only a recording of an earlier interaction with their mothers on the screen, so that no contingency was given between infant and maternal behavior. Babies with high affect-mirroring mothers exhibited increased smiling and vocalizations in the live condition but not in the replay condition. Hence, they were able to discriminate between contingent and noncontingent conditions. Babies of low affect-mirroring mothers were unable to do this: They smiled and vocalized comparatively infrequently in both conditions. The experience of interaction with affect mirroring had already led to marked differences in the babies’ responsiveness toward the high versus low affect mirroring of their mothers at the age of 2–3 months.

In summary, we can draw the following conclusions from these studies:
1. Caregivers intuitively mirror their infants’ emotion-specific expression signs in their own expression.

2. Infants register the contingent mirroring at an early stage, and then anticipate this from their caregivers.

3. Infants imitate their caregivers’ expression signs.

4. The interplay between parental affect mirroring and infant motor mimicry leads to a synchronization of expression signs. Alongside universal expression signs, dyad-specific expression patterns also start to emerge.

The impact of affect mirroring can also be derived from studies on children of depressive mothers. These studies indicate that the prompt reacting of depressive mothers to infant expression behavior may be reduced. Field et al. (1988) studied face-to-face interactions between depressive mothers and their infants. They found that depressive mothers used fewer mimic expression signs, fewer vocalizations, and less imitative and contingent behavior than nondepressive mothers, and that these differences were also reflected in fewer mimic expression signs and vocalizations in their babies. This muted expression behavior in the babies even generalized to interactions with nondepressive strangers. Moreover, Pickens and Field (1993) found emotion-specific effects: Babies of depressive mothers displayed more anger and sadness expression and less interest expression than babies of nondepressive mothers.

All these findings support the interdependence between the emergence of emotion-specific appraisal patterns and their corresponding expression signs, as assumed by the internalization model, and contradict any one-sided cause–effect relationship between appraisal and expression.

Second Postulate: Expression Signs Can Be Used Symbolically

A further transformation accompanies the emotion-specific differentiation of expression signs: Their emotion-specific conventionalization during interpersonal regulation transforms expressive reactions into expression signs. As conventionalized signs, they represent generalized emotion-specific action readinesses and their corresponding subjective feeling states (see Section 3.3.1). An expression sign does not just stand for a simultaneously triggered emotion (as a symptom), but can also, just like a word, be used to represent this emotion (as a symbol). Hence, it can also be used intentionally, be it for affect attunement, social referencing, play, or deceiving an interaction partner. According to Lewis and Michalson (1985), the process of conventionalization transforms those facial reactions that are generally interpreted as expressive patterns of basic emotions into expression signs that can also be used symbolically.

*The symbolic use of expression signs in social referencing.* One of the clearest examples of the conventionalization of expression and its symbolic use is the social
(or emotional) referencing exhibited by infants from about 10 months onward (see Hirshberg & Svejda, 1990; Klinnert, Campos, Sorce, Emde, & Svejda, 1983; Walden, 1991; Walden & Baxter, 1989). Infants seeking assurance from their mothers do not perceive their mother’s facial expression as a reflection of their own infant action readiness, but as a symbol for an emotional action readiness. Let us take an example: A stranger offers a 10-month-old boy a cookie in his mother’s presence. This confronts the little boy with a previously unknown situation. He first looks at his mother and reads off how he should behave from her facial expression. If she smiles, he will reach happily for the cookie; if she looks anxious, he will refuse it.

This is an enormous learning achievement for our 10-month-old. First, he has learned that he can attract his mother’s attention with a questioning gaze. Second, he has learned that this attention can also be focused on feelings—in this case, his own uncertainty about what he should do. Third, he has learned that facial expressions provide information on feelings—something he has learned through affect mirroring. Fourth, he has learned that his mother’s facial expression in this situation does not signal her feeling state and also does not mirror his own feeling state. It is an answer to his “question.” Smiling means, “Everything’s fine, you can do it!” A worried look means “Careful! Don’t do it!” And all this is managed without any speaking; just by using expression signs symbolically.

This example shows that even at the age of 10 months, expression signs can be perceived as symbols indicating what one should do. The expression sign “mother’s smile” is not taken as a symptom for a real-life feeling state in the mother, but as a symbol that has become detached from it. Nonetheless, this first symbolic use of signs is still embedded completely in the situational action context, and initially possesses only an indicative character: It indicates approach or avoidance. The expression sign has not yet acquired the multifaceted, generalized meaning that it possesses for adults. The same can be said about the use of first words (see Luria, 1982, pp. 51–70; see also Section 4.2.2).

The symbolic use of expression signs is not just found in social referencing. Demos (1982a) observed that all the infants in her study already displayed mimic emblems (Ekman & Friesen, 1969). Emblems are conventionalized mimic signs that are assigned a specific meaning with which they are used to regulate interaction. Demos observed, for example, raised eyebrows to express a question directed toward a partner, as well as exaggerated forms of expression applied very intentionally, such as prolonged nose wrinkling to express arousal. Another example from daily life is the cry that infants can initiate promptly when a wish is denied, but discontinue just as promptly if the wish is then met. This can also be characterized more appropriately as an intentionally applied expression symbol than as an authentic expression symptom of intense distress. Likewise, infants start to display emotions in symbolic play by imitating prototypical expressions, for example, they imitate a baby’s whining and crying or the comforting practices of parents in mother–child play.
Affect mirroring. Before infants can use expression signs symbolically, they have to perceive and acquire a subjective representation of contingencies between the cause of the expression, the expression itself, and handling it. This is the way in which expression signs acquire a relational meaning.

Furthermore, a second series of contingencies has to be built up so that an expression sign can be detached from the concrete emotion episode and used as a symbol, that is, to represent an emotion. These are contingencies between the sensations in infants generated by their own expression signs and the expression signs of the caregiver that mirror the infant expression signs in succinct, conventionalized ways. The mirrored expression thus becomes a sign marking the currently experienced feeling state (the object of the sign) that has acquired an emotion-specific meaning (the interpretant of the sign) for the infant through the repeatedly experienced contingency between cause, feeling, and action (see Section 3.3.1).

The smile that the caregiver uses to mirror the infant’s smile refers to the infant’s proprioceptively sensed smile. For the infant, this felt smile is linked to further typical sensations for the emotion of pleasure such as relaxation. It is also linked to a cause such as seeing the caregiver again and to an action to deal with it, namely, letting the state persist or initiating it again.

The affect mirroring of infant expression signs by caregivers who apply exaggerated conventionalized expression signs is accordingly also the mechanism that, at a later stage—from about the age of 9 months onward—enables the child to use expression signs symbolically.

Caregiver’s affect mirroring can be compared with the supportive speech known as “scaffolding” (Bruner, 1983) in language acquisition. Here as well, caregivers take the still incomplete signs, the babbled protowords of the infant such as “mama” or “nanna,” and repeat them in their conventionalized prototypical forms (e.g., “grandma” for “nanna”). This establishes a reference to the object to which the word refers. Just as this transforms the babbled protowords of the infant into object-related speech signs, the facial expressions of 3-month-olds become the emotion-related expression signs of the young child through face-to-face interaction with the caregiver. Just as infants require verbal stimulation and models before they can realize their innate speech potential in the acquisition of a language, they also require expressive stimulation and models before their innate emotion potential can unfold in the acquisition of an—in part, universal—expression culture.

In child development, symbol formation after the first year of life focuses particularly on speech signs. However, it is not fixated on language alone. In role-play, children also use abbreviated action schemes as symbols for their actions, when, for example, they pretend to be driving an automobile by sitting on a chair and making engine noises. They also use expression signs to display emotions. If the auditory channel is blocked by sensory impairment, then symbol formation may shift its medium to sign language, or in children who are deaf and dumb, to
finger spelling (see Aprauschev, 1988). The precondition for this, however, is a social environment that uses this alternative system of signs with the child, and facilitates acquisition of this system through supportive gestural or finger speech.

Third Postulate: Body Sensations Accompanying Emotions Are Transformed into Conscious Feelings

Affect mirroring elicits a further major transformation involving the feeling components of an emotion: the emergence of conscious feelings. This goes hand in hand with the emergence of expression signs. Without signs, there can be no consciousness (Vygotsky, 1931/1997); without expression signs, no conscious feelings.

The internalization model claims that feeling emerges from interoceptive and proprioceptive feedback on body and expressive reactions. Through affect mirroring, the unconscious sensation of this body feedback in the neonate becomes a conscious feeling in the infant. The all-encompassing, unfocused sensation of body and expressive reactions induced by an emotion is transformed into a categorically organized feeling. Characteristic for the latter is that from the range of simultaneous interoceptive and proprioceptive sensations, it singles out and emphasizes those sensations that are typical for the specific emotion and symbolizes these through an expression sign.

For the feeling state of pleasure, the expression sign that is also felt proprioceptively is smiling. At the same time, further feedback sensations are felt such as relaxation and warmth, vocal gurgling, or effusive movements that all characterize the subjective feeling of pleasure. In contrast, other current feedback sensations, for example, an itchy leg, although internally represented, are not classified to the pleasure feeling. Just as the formation of symbols in speech signs categorizes and structures the perception of the external world, the formation of symbols from expression signs links together and structures the perception of the internal world, that of interoceptive and proprioceptive sensations.

Gergely and Watson (1999) illustrate this transformation process through the analogy of biofeedback therapy for adults. Biofeedback provides an external display of internal body reactions such as heartbeat. Such external mirroring increases the sensitivity for those interoceptive body sensations that provide subjective representations of body reactions. It also enables clients to gain a degree of voluntary control over these body reactions (Dicara, 1970; Miller, 1978).

Parents’ affect mirroring provides a kind of natural biofeedback training for infants. Initially, infants may experience emotional expression and body reactions only as all-encompassing, unfocused proprioceptive and interoceptive sensations. Through affect mirroring, caregivers provide a contingent external representation of the infant expressive reactions. Because infants are very receptive to contingencies, sooner or later they will discover this contingency between their internal
sensations and the external expression representations. Stern (1985) has described this “discovery” as the outcome of parental affect attunement.

However, caregivers also possess their own emotions and display them in their expression. So, how can infants recognize that the emotional expression of their caregiver mirrors their own personal feeling state rather than that of the caregiver? According to Gergely and Watson (1999), the difference is that when caregivers engage in affect mirroring, they use exaggerated expressions of the emotion to be displayed. These correspond to the conventionalized expression signs used in their specific culture or subculture that, nonetheless, continue to possess enough similarity to the real expression reactions because of their iconic coding.

In their study of the interaction between mothers and their 3- to 6-month-old infants, Malatesta and Haviland (1982) reported that mothers generally mirrored, for example, infant anger with a mimically exaggerated play form of anger, so-called mock anger, or only with the succinct expression sign of wrinkling their brow. Papoušek and Papoušek (1987) reported that parents predominantly use exaggerated expression signs when interacting with their babies. The exaggeratedly affected practice of so-called baby talk is another well-known example of this.

This succinct way of mirroring expression signs and the temporal contingency between own sensation and mirrored expression is repeated over many episodes for infants. As time goes by, they no longer attribute the expression sign mirrored by the caregiver to their caregiver, but to the self, and they start to interpret it as an expression sign for their own current feeling. Gergely and Watson (1999) call the former process referential decoupling; the latter, referential anchoring. In this process, infants gradually develop a sensitivity for those proprioceptive and interoceptive sensations that correspond to their own emotion-specific expressive and body reactions. They learn to use expression signs to group these sensations in an emotion-specific manner and to relate them to their corresponding causes and actions. This makes them aware of their feelings. Unmediated, unfocused body sensations become conscious cause-focused feelings.

The phenomenon of affect attunement also fits into this context. Stern (1992) uses this term to describe a form of caregiver interaction with infants from the age of 9 months onward in which they mirror the characteristic style of their infant’s expression signs in another sensory modality. Stern (1985) gives an example:

A nine-month-old boy bangs his hand on a soft toy, at first in some anger but gradually with pleasure, exuberance, and humor. He sets up a steady rhythm. Mother falls into his rhythm and says, ‘kaaaaaa-bam kaaaaaa-bam,’ the ‘bam’ falling on the stroke and the ‘kaaaaa’ riding with the preparatory upswing and the suspenseful holding of his arm aloft before it falls. (p. 140)
The mother does not imitate the boy’s instrumental behavior, but the emotional shape and rhythm of his behavior through the emotional shape and rhythm of her voice.

This affect attunement is only a continuation of affect mirroring with a special means, namely, cross-modally mirrored expression signs. Stern assumed that the purpose of affect attunement is for the infant to acquire intersubjectivity, that is, to interpret and apply expression signs as a means for sharing intentions and feelings with others. This can direct the attention shared between caregiver and infant not only toward external objects (as seen so obviously in pointing gestures) but also to one’s own feelings and those of other persons.

Nonetheless, Stern (1985) assumes that infants already possess a conscious feeling experience that they only need to extend to other persons through affect attunement. We, in contrast, agree with Gergely and Watson (1999) that in affect mirroring or also affect attunement, both awareness of others’ feelings and awareness of one’s own feelings emerge. A conscious categorical feeling can start to exist only as a feeling that can be communicated through a sign and thus shared with others. One could call this a “public” discovery that the infant makes in interaction with others, and not a “private” discovery that the infant makes alone.

We assume that once feelings have become conscious they do not just make it possible to adjust expressive and body reactions to fit one’s motives, but that they are also a first step toward reflective emotion regulation. Accordingly, becoming aware of feelings does not simply emerge from the symbolic use of speech signs and thereby during verbal symbol formation, but is already present at a much earlier stage in the symbolic use of expression signs (see Lewis & Michalson, 1985; Malatesta & Izard, 1984).

4.2.2. THE EMERGENCE OF VOLITIONAL ACTION REGULATION

The internalization model assumes that the symbolization of expression signs paves the way for symbol formation with the help of speech signs, and that volitional action regulation becomes possible only through the acquisition of language.

As already explained in Section 3.4.1, one can assign to volitional processes the function of anticipating a future situation of motive satisfaction as goal that direct current actions toward this future situation through self-instruction and shield them from competing action impulses (Kuhl, 1996). This requires a symbolic medium with which future, still only potential, event scenarios can be presented and manipulated voluntarily. Although this medium is predominantly language, it also includes gestures or expression signs. Hence, the use of speech signs and other signs marks the beginning of the volitional regulation of actions and emotions.

These voluntary processes also emerge interpersonally within infant language acquisition. The beginning of speech acquisition can be traced back to the early intentional utterances of babies (see Papoušek, 1994). Up to approximately the
third year of life, two milestones in speech development occur that are significant for volitional action regulation.

*The initial complementarity of emotional and volitional action regulation.* Initially, both forms of regulation seem to function in a complementary way. Infants use their first speech signs almost exclusively either within emotionally neutral states or within the emotional state of interest. As soon as other emotions are induced such as anger or even pleasure, interaction returns to being regulated almost exclusively with the help of expression signs (see Bloom, 1993). Put plainly, infants either speak or they have emotions; they do not have both at the same time.

In a longitudinal study, Bloom (1993) observed play interaction sessions with mothers in six girls and six boys once every month from the age of 9 to 21 months. She compared the infants’ verbal and expressive behavior at the time of the first clear use of conventional words with that at the time of their vocabulary spurt. This is the phase in which infants make a rapid advance in the acquisition of new words. On average, the observed children used their first words at the age of 12.8 months, and their vocabulary spurt occurred at 19.2 months.

She found that:

1. The percentage of emotional expression in the entire observation session remained constant throughout the study, whereas the percentage of speech rose from almost zero to the same level as emotional expression. Hence, speech signs do not replace expression signs.
2. Generally, the infants spoke their first words predominantly while exhibiting no expression, in other words, while in a neutral emotional state. At the time of the vocabulary burst, in contrast, they already used significantly more words while displaying a slightly positive emotional expression, but not while displaying either negative or more highly positive ones. This applied particularly to those words with which they were most familiar. Hence, expression signs and speech signs start off by being used independently from each other. It is only with the onset of the vocabulary spurt that infants begin to combine the two and speak emotionally toned words. This can be interpreted as an increasing integration of the emotional and volitional regulation levels.
3. In infants displaying a high proportion of emotional expression, both the first use of words and the vocabulary spurt started notably later.
4. Up until the vocabulary spurt, infants nearly always applied their words indicatively to describe what they were doing at the time or what had attracted their attention, but not in an instrumental sense to influence their mother to do something particular for them.

So, infants predominantly use their first words indicatively. They show objects to their caregivers and utter a more or less appropriate word (Luria, 1982, pp. 56–63). Caregivers repeat the word—they mirror it—and also establish its
relation to an object by performing a typical action with it or uttering a typical sound for it (e.g., the cow goes “moo”). Observing this behavior leads to the conclusion that infants, unlike older children and adults, do not yet use speech signs as a universal means of regulating relationships. This is still the preserve of expression signs.

Initially, the first words seem to serve only a limited purpose, namely, to attain intersubjective understanding: By using words indicatively, infants get their caregivers to participate in their perceptions and to either confirm that the indication is correct or rectify “mistakes.” This mirroring by caregivers—analogue to affect attunement in expression signs—establishes an intersubjectivity over the common focus of attention, namely, the object or condition described by the word. Hence, a sign is not used as a reciprocal instrumental appeal for the other to act to serve one’s own motive satisfaction, but in the sense of obtaining a reciprocal agreement on one’s own “worldview.” Bloom (1993) summarizes her observations on early language acquisition as follows:

Children learn language in the first place because they strive to maintain intersubjectivity with other persons—to share what they and other persons are feeling and thinking. (p. 245, italics added)

One can interpret this as a social reassurance that becomes generalized to the use of words. This striving toward intersubjectivity can be characterized as a motive to attain social agreement on one’s own “worldview.” We assume that this communication motive is a fundamental human need that cannot be reduced to other human motives. It is an end in itself.*

Speech signs as an action appeal. The second milestone in volitional development is the realization that speech signs can be used universally as action appeals toward others—not just to establish intersubjectivity, but also to persuade others to carry out actions serving all other motives. This also includes the child’s appeal to his or her caregiver not to block his or her intentions and actions, emphatically signaled by the phrases “I want…” or “myself” (see Geppert & Küster, 1983). Parallel to this, it starts to become possible to tell infants what to do through speech signs.

Initially, however, speech has only the character of compelling action. Although 1- to 2-year-olds can carry out verbal instructions such as clap hands or wave without any problem, such instructions only trigger reactions that cannot be regulated or inhibited.

*In this context, it is interesting to note that research on primates reveals that chimpanzees can be taught to use symbols, but they generally apply them only in relation to instrumental behaviors of need satisfaction such as the search for food. It is only very rarely that they use them for communication or to seek agreement over mutual perceptions (see Fouts, 1997). Hence, chimpanzees do not seem to feel a genuine need to communicate.
Luria (1961) reports a study in which 2-year-olds were instructed to squeeze a rubber ball when a light came on in order to switch it off again. When told, “If the light comes on, squeeze the ball,” the 2-year-olds immediately started squeezing, and carried on doing this repeatedly (see Figure 4.1A). If there was an immediate contingency between reaction (squeeze) and stimulus (light off), they could control their behavior in line with the task (see Figure 4.1B). However, even the commands, “Don’t squeeze!” or “That’s enough!” triggered the squeeze reaction. In addition, the infants performed the task less well when the light was occasionally extinguished independently from the ball squeeze. Hence, at this stage of development, speech functions exclusively as an action-initiating appeal by others—dependent from the specific meaning of what is spoken. Two-year-olds are not yet able to control, and certainly not to stop, their actions.

Hence, being told not to do something is cognitively too demanding for a child of this age, unless the nonverbal part of the “No!” is so emotionally impressive that children abandon their intentions because of the emotion induced. A tiresome learning process is required before the meaningful content of what is spoken becomes effective in action, and self-instruction can be used effectively for one’s own action regulation (see Luria, 1982).

4.2.3. Precursors of Reflective Emotion Regulation in Infants and Toddlers

The development of emotional action regulation can be understood more appropriately by also considering the complementary process: namely, the development of the ability to regulate one’s own emotions. Babies and infants extend their repertoire of emotion regulation strategies, and these can be viewed as precursors for reflective emotion regulation.

Infants possess two innate strategies that they can use to modify their emotions in intensity and duration but not in quality. These are averting their gaze and sucking (see Section 4.1.2). Because these strategies can be successful only within
a relatively narrow band of arousal, emotional regulation develops predominantly in the form of an interpersonal regulation between child and caregiver. Initially, caregivers take over the task of activating babies when they display signs of disinterest and calming them when they display signs of distress. This enables them to maintain an optimal level of arousal (Papoušek & Papoušek, 1987). When doing this, caregivers can augment the innate strategies directly by, for example, *distracting, calming, or affective contagion*. In addition, they can resort to an *antecedent emotion regulation* by preselecting contexts that are suitable to serve motives in order to rule out over- or understimulation of the baby in advance. Thompson (1990) called this “control of opportunity.”

As babies interact with their caregivers, they learn to address their emotions toward them intentionally (see Bridges & Grolnick, 1995). This is because caregivers generally respond promptly with measures that will help negative emotions to subside and positive emotions to persist.

Babies are initially unaware whether caregivers react to their emotions with either problem- or emotion-focused actions. The former serve to satisfy a motive that has been stimulated; the latter, to make the emotion subside when a motive cannot be satisfied (Lazarus & Folkman, 1984). For example, through purposeful distraction with a new toy, a father may try to capture his baby son’s attention and make him forget his original frustration at not being allowed to play with his big sister’s felt-tip pens. Because infants live very much in the immediate present and have not yet built up lasting intentions or expectations, it is easy to influence their emotions by distracting them.

During the course of the second year of life, this changes as infants learn to distinguish self from other *consciously*, become aware of their own intentions and expectations along with those of others, and begin to perceive the two separately. This newly acquired ability leads to a qualitative change in caregiver–infant relations: The conscious differentiation between self and other marks the onset of an independent regulation of own actions and emotions.

From the child’s perspective, emotional action regulation is the dominant level of regulation; that is, the goal is to satisfy motives immediately. It can be seen that toddlers increasingly use instrumental acts to eliminate the source of a negative emotion during the second year of life (Stansbury & Sigman, 2000). Studies on emotion regulation view such instrumental acts as emotion-regulating strategies (e.g., Grolnick, Bridges, & Connell, 1996; Parritz, 1996; Stansbury & Sigman, 2000). However, because they are performed with the goal of motive satisfaction and not the goal of making the emotion subside, our internalization model views them as *problem*-focused actions located on the level of emotional action regulation and not as emotion-focused actions located on the level of reflective emotion regulation.

The same holds when problem-focused actions fail to achieve the intended goal, as in studies on delay of gratification. Staring at the desired present, touching
it, or trying to grab it are problem-focused actions aimed toward acquiring it. They are scarcely appropriate for keeping the current desire for the present under control and coping with a delay in gratification. Hence, infants are generally unable to delay their gratifications by themselves (Raver, 1996).

Nonetheless, infants also acquire a few strategies during these first 2 years of life that enable them to exercise a degree of intrapersonal regulation over the intensity and duration of their emotions. For example, action schemes already used for a problem-focused actions can also be applied as emotion-focused strategies. By the end of the second year of life, the repertoire of emotion-focused strategies includes calming, distraction, and the first symbolic strategies (cognitive reinterpretation). These will be sketched in the following.

**Calming strategies.** Innate sucking is expanded to sucking on a pacifier, thumb sucking, or using a comfort blanket. Bridges and Grolnick (1995) talk about physical self-soothing. Mangelsdorf et al. (1995) report that such strategies are applied at a very early stage and decline toward the end of the second year of life.

**Distraction strategies.** The only response to overstimulation available to young babies is to avert their gaze. The acquisition of mobility expands the action options of infants to include running away, avoiding, or “leaving the stage.” This provides them with a greater spatial range of tension regulation (Mangelsdorf et al., 1995). Object manipulation can also become an emotion-focused action when it is used to distract from a negative stimulus. Bridges and Grolnick (1995) observed this strategy in a study of delay of gratification in 2-year-olds and called it active engagement with a substitute toy.

**Symbolically mediated strategies.** These are cognitive reinterpretations that first become possible with the development of symbolic functioning. As a result, they are still very rare in infants (see Bridges & Grolnick, 1995), and this is also why caregivers hardly ever apply them.

**Antecedent strategies.** These involve the purposeful selection and control of contexts providing situations that trigger positive emotions and avoiding situations that trigger negative emotions (see Thompson, 1990). Only caregivers apply these strategies because they require a volitional representation of future situations that is still beyond the reach of infants.

During infancy, the central developmental trend is the formation of emotion-focused intrapersonal strategies out of prior experiences with interpersonal regulation. All the strategies mentioned here can be applied both inter- and intrapersonally. For example, by providing physical contact, caregivers can exert a calming effect on their infant. They can distract the infant with a substitute toy, or they may even try to offer a reinterpretation of the situation. It can also be assumed that infants do not proceed directly from inter- to intrapersonal regulation, but pass through a preliminary stage in which they initiate interpersonal regulation themselves and actively seek the support of others (see Walden, 1991). For example, they may actively seek their caregiver in order to be calmed and solaced. They
may initiate joint actions (Mosier & Rogoff, 1994) with the goal of distracting themselves from the source of a negative emotion (Bridges & Grolnick, 1995). Finally, they may initiate an interactive reinterpretation of the cause by directing pointing gestures or questioning emblems toward their caregivers.

4.2.4. INTERINDIVIDUAL DIFFERENCES

Up to now, we have assumed that caregivers are generally able to mirror infant expression adequately, to interpret their appeals appropriately and to respond to them. Thereby, they offer optimal conditions for infants to develop their repertoire of emotional action regulation. Even when most caregivers are fairly efficient in “reading” emotional expression, there are still interindividual differences. On the side of caregivers, these are seen in their sensitivity toward infant signals. For example, sensitive mothers tune their reactions better to the state of their infants than less sensitive mothers (Malatesta, Shepard, Culver, & Tesman, 1989; Tronick, 1989). On the side of the infants, there are individual differences in dispositional emotional readiness that make it easier or more difficult for caregivers to interpret their emotional expression and to regulate their emotions in a motive-appropriate way. These dispositional emotion readinesses are attributed to infant temperament (see Zentner, 1999).

Differences in Temperament

Even though there is still no generally accepted definition of temperament, Kagan (1994, p. 40) proposes that the different temperament concepts have one common denominator: “Temperament conventionally refers to stable behavioral and emotional reactions that appear early and are influenced in part by genetic constitution.”

Nonetheless, different fields of research and theories continue to disagree on the number and organization of temperament factors. For example, Buss and Plomin (1984) assume only three factors: Emotionality, Activity, and Sociability, although they also assess a Shyness factor separately in their questionnaire. In contrast, Martin, Wisenbaker, and Huttunen’s review (Martin, Wisenbaker, & Huttunen, 1994) of studies on the temperament model of Thomas and Chess (1977) concluded that seven factors could be identified reliably and validly: Approach/Withdrawal, Activity Level, Negative Emotionality, Distractibility/Persistence, Adaptability, Regularity, and Sensory Threshold. A comparison of the various concepts and their empirical operationalizations reveals that several of these individual factors overlap (see also Goldsmith et al., 1987; Kohnstamm, Bates, & Rothbart, 1989).

What is interesting in our context is the observation that temperament factors appear in typical clusters or syndromes that impact significantly on the
development of effective interpersonal regulation. Thomas, Chess, and Birch (1968) were the first to identify three syndromes of temperament factors in infants. These have now been confirmed at least in part by other groups of researchers.

Robins, Johns, and Caspi (1998) report that these clusters discriminate between children who are ego-resilient, overcontrolled, and undercontrolled. The first cluster contains approximately two thirds of all children; each of the other two, 15–20%. Ego-resilient children are extraverted, good-natured, and, of course, resilient, making them relatively easy for caregivers to rear. Overcontrolled children appear to be socially inhibited and anxious, but are also comparatively easy to rear because they are receptive and easy-going with familiar persons. In contrast, undercontrolled children are highly active and impulsive; they have irregular eating and sleeping habits (so-called low Regularity); they try to avoid new persons or situations (Withdrawal); they are slow to adapt to changes in, for example, daily routines or foodstuffs (low Adaptability); and when frustrated, their emotional reactions are highly negative (high Negative Emotionality). These dispositional temperament characteristics make it harder to give these children a sensitive and caring upbringing. Parents, pediatricians, and nursery school teachers generally report having difficulties in regulating their emotions adequately and maintaining them at an optimal level of arousal. These are also the children who most frequently develop psychological disturbances.

When dealing with undercontrolled children, caregivers have to develop very special adaptation and regulation routines in order to build up an effective interpersonal regulation. As a result, recent temperament concepts (see Zentner, 1998, 1999) do not regard temperament per se as the decisive variable for successful or unsuccessful development, but the fit between the temperament of the child and the expectations, perceptions, and reactions of caregivers.

Caregiver Sensitivity and Attachment Qualities

**Caregiver sensitivity.** The sensitivity of caregivers is a further central variable contributing to the emergence of interindividual differences in the quality of emotional action regulation. Sensitivity means that caregivers perceive the infant signals transmitted through emotional expression and acts, interpret them correctly, and react to them promptly and appropriately (Ainsworth et al., 1978). Sensitive caregivers are capable of adequately perceiving the, in part, very unspecific and subtle forms of expression in their babies and using these to deduce their babies’ needs appropriately, regardless of their own personal motives at the time. Hence, sensitivity is an important condition if intuitive parenting is to follow an undisturbed course.

In a longitudinal study, Spangler, Schieche, Ilg, Maier, and Ackermann (1994) observed infants and their mothers in an unstructured play situation at the ages of 3, 6, and 9 months. They recorded expression components (extent of negative vocalization and motor restlessness) as well as salivary cortisol secretion as an
important body component. The level of the hormone cortisol in saliva is a well-known physiological indicator of stress. Children of sensitive mothers displayed less pronounced negative expression and body reactions at all three measurement times than children with less sensitive mothers. Ainsworth and Bell, (1974; Bell & Ainsworth, 1972) reported that babies whose mothers reacted very sensitively to their crying in the first months of life cried far less frequently at the end of the first year of life and also possessed more differentiated communication abilities.

Sensitive caregivers do not just encourage the development of children’s emotions through affect mirroring. They also enable them to experience that it is “useful” to express positive and negative emotions because these will elicit the appropriate reaction in the caregiver to satisfy the child’s motives. Our own study of 2-year-olds showed that in an emotionally stressful situation, children of sensitive mothers displayed a markedly more negative emotional expression compared with children with less sensitive mothers (Friedmeier & Trommsdorff, 2001). Maternal sensitivity seems to encourage children to clearly express their emotional state.

Sensitivity, however, should not just be viewed as a personality trait in caregivers. How far they actually achieve a sensitive interaction with their babies also depends on internal and external conditions. For example, an unwanted pregnancy or a (postpartum) depression in the mother may impact negatively on intuitive parenting and sensitivity (see Field et al., 1988). Regulation disturbances in babies’ sleeping and eating habits as well as excessive crying or a so-called undercontrolled temperament (see above) may also impact negatively on parental sensitivity (Papoušek & Papoušek, 1997).

Attachment qualities as differential emotional regulation patterns. Attachment is conceived as an emotional bond between two persons in which closeness and contact to the other person are sought in order to satisfy the need for security, contact, and affection. Its adaptive function is considered to be that closeness to caregivers protects babies from danger and provides opportunities for learning (see Bowlby, 1969). Children’s attachment to their caregivers develops during the course of the first year of life. The caregiver’s sensitivity has a major impact on the quality of this attachment relationship—as confirmed in numerous studies (Ainsworth et al., 1978; Grossmann, Grossmann, Spangler, Suess, & Unzner, 1985; Spangler, Fremmer-Bombik, & Grossmann, 1996).

This quality of attachment corresponds with specific patterns of emotional expression ability and emotional action regulation (Spangler, 1999). That can be seen very clearly in the Strange Situation Test. This test presents a situation designed to initially stimulate explorative behavior and then to activate the attachment motive by separating babies twice from their mothers and confronting them with a stranger (Ainsworth & Wittig, 1969). Attachment quality is deduced from the behavior and expression displayed in the two separation and reunion episodes. In general, four qualities of attachment are distinguished (Ainsworth et al., 1978; Main & Solomon, 1990): secure, insecure-ambivalent, insecure-avoidant, and disorganized.
Spangler (1999) has analyzed these attachment qualities from an emotional perspective, and reinterpreted them as differential patterns of interpersonal emotional regulation between caregiver and child in which the emotion components of expressive and body reaction (see Section 3.1.1) interact in different ways. To a major extent, this interplay of emotion components seems to be determined by the experiences in the caregiver–child interaction and the parental sensitivity this involves. Therefore, these differential findings can also be integrated into the internalization model of emotional development. They can be used to provide further support for the premise that emotions are not fixed, immutable reaction patterns, but that the emergence and interplay of their components is first generated by early interaction experiences in interpersonal regulation. We shall now support this through a detailed description of the different “orchestrations” of the emotion components that Spangler (1999) found in the attachment qualities and a discussion of how they have emerged.

**Emotional expression pattern of children with secure attachment.** The emotional expression pattern of these children is situationally appropriate in each phase of the Strange Situation Test and possesses a clear appeal character toward the caregiver. In the presence of their mothers, they display exploration behavior and express their positive emotions clearly as a sign that they wish to maintain the relationship and the joint activity (see Cassidy, 1994). When the stranger joins them, these children regulate possible irritations through social referencing with their mothers. When the mothers leave, they clearly express sorrow about being left alone: They start to cry and try to follow their mothers. When the mothers return, they actively seek (physical) contact and let themselves be picked up. Their mothers’ consoling behavior calms them relatively quickly so that they can return their attention to play. Emotional expression has adopted a clear symptom and appeal function that orients caregivers promptly and unequivocally toward the needs of their children so that they can then perform motive-serving acts just as promptly. In earlier chapters, we have described such an interpersonal regulation pattern as adaptive and “normal.”

The, in part, high negative expression intensity in the separation and reunion phases is not accompanied by a comparable intensity in autonomous body reactions. Although Spangler and Grossmann (1993) found that the children’s heart rate increased during the separation phase, which can be interpreted as a sign of tension, there was no increase in the secretion of cortisol, the physiological indicator for stress reactions (Gunnar, Broderson, Nachmias, Buss, & Rigatuso, 1996; Hertsgaard, Gunnar, Erickson, Nachmias, 1995; Spangler & Grossmann, 1993; Spangler & Schieche, 1998). Intraindividual comparisons also revealed no correlation between the intensity of negative expression and cortisol secretion (Spangler & Schieche, 1998; see Table 4.1).

This pattern is explained through the interaction experiences that securely attached children have been able to have with their sensitive and attentive caregivers. In countless distress episodes, they have experienced that their caregivers react to
ONTOGENESIS OF EMOTIONS AND THEIR REGULATION

TABLE 4.1. Correlations between Cortisol Secretion and Negative Expression during the Separation and Reunion Phases of the Strange Situation Test at the Age of 12 Months

<table>
<thead>
<tr>
<th>Attachment quality</th>
<th>Secure</th>
<th>Insecure avoidant</th>
<th>Insecure ambivalent</th>
<th>Disorganized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cortisol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After 15 min</td>
<td>-.08</td>
<td>-.10</td>
<td>-.07</td>
<td>.00</td>
</tr>
<tr>
<td>After 30 min</td>
<td>.16</td>
<td>-.04</td>
<td>.13</td>
<td>.69**</td>
</tr>
</tbody>
</table>


their expression of distress and sorrow promptly—with the consequence that the infant motive is satisfied and positive emotions are triggered. The expression components of the emotions are able to optimize their appeal function so successfully that there is no need for an endocrinological adaptation to the stress situation. The emotional reaction here does not support a rigid arousal model in which the triad of expression, body reaction, and feeling is always activated with the same intensity, but indicates an experience-dependent regulation model in which emotion components are singled out and activated according to their relative success in past experience (see Spangler, 1999).

Emotional expression pattern of children with insecure-ambivalent attachment. The emotional expression pattern of these children has a clear symptom function, but its appeal function is not really developed effectively (see Spangler, 1999). During the play phases of the Strange Situation Test, these children seem to be rather anxious and clinging; they find it hard to start playing. Their attention is focused strongly on the availability of their caregiver, and this impedes exploration of their physical and social environment. Just the mere appearance of the stranger already clearly impairs play quality. They react to separation from their mothers with a strong negative expression. When mothers return, these children also make contact, but simultaneously display anger and protest. They fend off physical gestures of consolation and calm down only slowly. They require a correspondingly long time to get back into their play.

Unlike the securely attached children, cortisol levels in this group increased during the Strange Situation Test (Spangler & Schieche, 1998), with a high correlation between the strength of negative emotional expression and the amount of cortisol secretion: Children who cried and protested strongly had high cortisol levels (see Table 4.1).

This interaction pattern can likewise be explained by the infant interaction experiences with their caregivers. The latter exhibit an inconsistent caring behavior in response to their children’s emotions. Sometimes, they react sensitively and promptly; other times, not. And this does not follow a predictable pattern for the
child. This ambivalent caring behavior obliges children to increase their emotional expression until caregivers have to respond, but they then tend to do this irritably and reluctantly. The outcome is an ambivalent experience for the infants that they sometimes gain comfort and attention with their sorrow, but at other times, not. This goal blockage triggers, in turn, frustration and anger. The children cannot build up any reliable expectations regarding the availability of their caregivers, and so they also cannot be calmed by them effectively. The dysfunctionality in interpersonal regulation based on emotional expression makes it necessary to adapt on the level of body reactions. This involves, among others, the secretion of the stress hormone cortisol and an activation of further stress-sensitive systems such as the immune system and the adrenal medulla system. After being reunited with their mothers, these children return to play only slowly because stress hormones are still effectively preventing relaxed exploration and play.

*Emotional expression pattern of children with insecure-avoidant attachment.* 

The emotional expression behavior of these children leaves the impression that they experience the Strange Situation as being only slightly emotionally disturbing. When caregivers are present, they display interested play and explorative behavior; and this also continues when the stranger joins them. During the separation phase, they also reveal an increase in heart rate and a restricted play and exploration behavior (Spangler & Grossmann, 1993), which can be interpreted as symptoms of emotional tension. However, they display hardly any negative emotional expression. When mothers return, they initially pay no attention to them. They avoid body contact, and also continue to show hardly any negative emotional expression.

Findings on cortisol reactions are contradictory. Spangler and Grossmann (1993) found an increase in cortisol levels in the children with insecure-avoidant attachment in their sample. However, further studies failed to replicate this (Hertsgaard et al., 1995; Spangler & Schieche, 1998). Nonetheless, Spangler and Schieche (1998) were able to show that the degree of negative emotional expression correlated with the increase in cortisol (see Table 4.1). Children with intensive negative emotional expression had a high cortisol secretion, but also—vice versa—children with no mentionable emotional expression did not have high cortisol levels. Because children with insecure-avoidant attachment generally show little negative emotional expression, their endocrinological stress reactions should accordingly also be limited. This would indicate that the symptom function of the weak emotional expression in these children is a reliable indicator that they tend to experience little emotional stress in the Strange Situation Test.

This runs counter to a previously popular interpretation in terms of attachment theory. It claims that the attachment system has to be activated in the Strange Situation Test, and the children therefore experience sorrow but suppress its expression. This is then considered to be a sign of a dysfunctional emotion organization. Main (1981), in contrast, views the avoidant attachment pattern as a “second-best” strategy that may well be functional for a given caregiver–child dyad. The avoidant
expression behavior in attachment-relevant situations continues to permit a certain closeness to the caregiver and protects children from the negative parental rejections that would have resulted from negative emotional expression.

Children with insecure-avoidant attachment have insensitive caregivers who tend to respond to their negative emotional expression with rejection and avoid close physical and emotional contact (Spangler et al., 1996). Nonetheless, they still attend to their children and satisfy their needs—but according to their own rhythm and not that of their child. In the children, this leads to the extinction of a strongly negative emotional expression in favor of an avoidant-reserved reaction pattern, and emotional reaction readiness becomes muted.

The internalization model assumes that when these children find themselves in the Strange Situation, they should neither display a negative emotional expression of sorrow nor reveal autonomous sorrow or stress reactions, and they should also not experience a subjective feeling of sorrow. Hence, they would not suppress a sorrow expression, but actually feel hardly any sorrow, because the subjective feeling arises through feedback on expressive and body reactions (see Section 3.1.2).

Accordingly, the symptom and appeal function of the expression seems to be undeveloped in these children. The possibility of finding support from caregivers is abandoned at a very early stage in favor of intrapersonal strategies. In a study by Braungart and Stifter (1991), children with insecure-avoidant attachment displayed more self-focused behaviors such as thumb sucking and less orientation toward their mothers when reunited with them in the Strange Situation Test. This denies the children learning opportunities in which they could experience and internalize efficient regulation strategies through interpersonal regulation. Instead, they have to work out the effectiveness of their arbitrarily chosen intrapersonal regulation strategies for themselves through trial and error.

These differential findings indicate the developmental openness of the emotion system. The emergence and interplay of emotion components adapts to the interaction experiences acquired in the interpersonal regulation between caregiver and child.

4.2.5. Summary

Through their sensitivity toward infant expression signs, caregivers are able to regulate the emotions of their babies. They interpret the infant expression sign as an appeal directed toward them and feel obliged to provide prompt and appropriate care. This enables infants to experience temporal, sensory, and spatial contingencies between the cause of an emotion, its expression, and the action to deal with it, and this leads to the emergence of meaning-dependent appraisal patterns.

In addition, caregivers mirror infant expression signs in their own expression in succinct and conventionalized ways. Through this affect mirroring, children also experience contingencies between expression, feeling, and its action-regulating
consequences, and this leads to the emergence of the symbolic use of signs and the conscious perception of feelings (see Gergely & Watson, 1999; Stern, 1985). Repeatedly experienced contingencies between cause, expression, and action in conjunction with the affect mirroring of caregivers and the motor mimicry of the infants produce two interlinked effects in infants: (1) Expressive reactions are transformed into expression signs. (2) These signs categorize the perception of the internal world of feelings emotion-specifically through body feedback—just like speech signs organize the perception of the external object world into categories.

Out of the interpersonal emotion regulation initiated by caregivers, children develop a more independent form of regulation during the course of the second year of life. This is characterized particularly by the way they become able to actively demand their caregivers’ assistance in regulation.

4.3. THE EMERGENCE OF INTRAPERSONAL REGULATION LEVELS IN TODDLERS AND PRESCHOOLERS

The first 2 years of life are characterized by enormous progress in development. Children build up a differentiated spectrum of emotion systems such as pleasure, joy, affection, amusement, frustration, anger, defiance, fear, surprise, sorrow, sadness, and embarrassment (Sroufe, 1996, p. 68). They discover language as a universal medium that they can use to direct the actions of others. They acquire a broad repertoire of actions with which they can manipulate objects appropriately in their daily lives and satisfy their own motives. In their interactions with their caregivers, children become increasingly equal partners insofar as they can use expression and speech signs to attract caregivers’ attention relatively clearly and promptly to their motives and expectations, so that caregivers can then ensure that infants’ motives are satisfied just as clearly and promptly.

Up to now, we have assumed that caregivers do everything in their power to attend to their babies’ emotional appeals promptly and reliably. They try to satisfy the motives signalized to them unconditionally, or, if this is impossible, to regulate infant emotions with the help of distraction strategies. This requires caregivers to exercise a high level of reflective regulation in their own emotions. Infants do not query whether their appeals are in any way compatible with their caregivers’ motives; in other words, how far their caregivers are willing and able to respond to them. Infants want their motives satisfied here and now, and they are not prepared to wait until tomorrow or even later. This forces caregivers to take notice of infant appeals straight away, even when this runs counter to their own motives. If caregivers are not capable of such a reflective emotion regulation, interpersonal regulation may become severely disturbed, and this may even lead to abuse and neglect (Cicchetti & Carlson, 1989; Esser, 1994).

Hence, the relation between caregiver and infant continues to reveal a major imbalance in reflective emotion regulation. Overcoming this imbalance and
becoming able to regulate actions and also emotions intrapersonally is the major developmental task for infants and preschoolers. They have to learn to coordinate satisfaction of their motives with their social environment; if necessary, to rank their motives in order of importance and to either delay their gratification or even abandon them completely. This confronts them with completely new demands. It is no longer enough for children to simply be guided by their emotions and to expect from their caregivers that they furthermore are willing to follow their emotional appeals in every case and situation. Children have to develop the ability to not live out an emotional action readiness, that is, to inhibit an emotion and to engage in alternative actions for which no spontaneous emotional action readiness is available.

This task reveals a fundamental characteristic of human motive satisfaction. It is something that we have not considered up to now, although it plays a central role in the development of an autonomous regulation of actions and emotions in adults as well.

Human motive satisfaction is not an individual act, but is always embedded within a network of social relations. For many of the actions required to satisfy their motives, individuals are dependent on coordination with other persons and their motives. Even just obtaining food to satisfy one’s hunger requires a coordination of actions by numerous human beings. The way in which such social relations are coordinated cannot be varied at random, but is subject to material constraints as well as cultural norms and rules that map out how this social coordination of individual motives should proceed and how much scope is available to the individual. Hence, a fully developed adult emotional and volitional action regulation requires not only the possession of differentiated emotions and volitions, but also the ability to coordinate them with cultural norms and demands.

Mastery of this developmental task requires a further qualitative change in the three levels of regulation. This is also accompanied by a change in the relation between caregiver and child. Sooner or later, caregivers start to no longer just care for their children’s needs unconditionally, but also to encourage them increasingly to regulate their actions and emotions themselves. They also start to evaluate their children’s actions in the light of cultural norms and rules. Here again, there is a broad cultural and individual diversity in how these demands for autonomy should be presented to the child. However, all paths to more self-regulation are linked to the following three developmental trajectories:

1. On the level of emotional action regulation, caregivers shift to encouraging and helping their children to take the expression signs acquired in interpersonal regulation and apply them in intrapersonal regulation. They should no longer understand their own expression appeals as appeals to another person who will then ensure motive satisfaction, but as an appeal to the self, and they should perform the necessary emotion- and problem-focused actions themselves.
Caregivers can encourage their children to form new motives directed toward maintaining cultural norms such as wanting to be like admired others (Holodynski, 1992) or wanting to achieve something (Heckhausen, 1985). These norm-oriented motives lead to the emergence of new emotions that evaluate the self in the light of cultural norms and rules, control norm-violating emotional action readinesses, and divert them onto norm-appropriate paths. They include the self-evaluative emotions pride, shame, guilt, and indignation (see Buss, 1980; Geppert & Heckhausen, 1990; Holodynski, 1992; Mascolo & Fischer, 1995; Sroufe, 1996; Stipek, 1995; Stipek, Recchia, & McClintic, 1992).

2. On the level of volitional action regulation, growing language competence leads caregivers and children to increasing use of verbal instructions and demands in their mutual action regulation. The meaning of speech becomes effective for action, and children begin to use speech for self-instruction as well and thus for intrapersonal regulation. Private speech emerges (Diaz & Berk, 1992; Vygotsky, 1934/1987).

As a result, caregivers expect their children to stop communicating their appeals with expression signs and to start formulating them verbally. Instead of reaching a hand out for the cookie and whining loudly, they should now utter a verbal request. This calls for the further development of speech in terms of its action-regulating aspects, and, in many aspects, an, in part, wearisome relearning of expression signs as speech signs.

3. On the level of reflective emotion regulation, caregivers can start to exploit the newly acquired ability to create and use signs and also apply symbolic strategies of emotion regulation. Through the use of reinterpretations, imagery, or organizing motives into a time schedule, they can encourage their children to regulate their own emotions and give up contrary intentions at least in the short term. However, this calls for a level of symbol formation and volitional regulation that only starts to be mastered at 4–5 years (Bischof-Köhler, 2000). As a result, these strategies tend to be implemented after the emergence of self-evaluative emotions. In the following, we shall discuss how the development of intrapersonal regulation proceeds on all three regulation levels.

4.3.1. THE EMERGENCE OF INTRAPERSONAL EMOTIONAL ACTION REGULATION

Intrapersonal Regulation as a Zone of Proximal Development

Intrapersonal regulation emerges as children start to satisfy their motives for themselves by doing that which caregivers have previously done for them. Infants
already possess differentiated emotions, but these are directed toward regulating others. They also have a series of motive-serving actions at their disposal, but they still do not apply them consistently for their own emotional action regulation. Their task is now no longer to demand the support of others in every emotional episode, but to autonomously select and carry out suitable actions. At first, their mastery of this task is rather random and fluctuating. The transition does not occur abruptly, but is more of a slow withdrawal of interventions by the caregiver.

For example, a little girl wants to fetch her rag doll from a drawer, but it has got stuck inside. She starts to get angry, and looks toward her father in a demanding way. Instead of fetching the doll for her, he considers it sufficient to give her back an encouraging appeal to try again with a little more force, and he demonstrates the movement she needs to make. The girl can follow this cue, tug strongly at the doll several times, and actually manage to release it by herself. The action of the caregiver was to mirror the child’s emotional impulse, but to return the emotional appeal directed toward him back to her, so that she feels challenged to act for herself.

Mirroring the appeal shows how one can conceive intrapersonal regulation on the basis of the model of interpersonal regulation. The appeal is conceived as an appeal to the own person, and the other person is no longer needed as a mirror.

In this process, children start off by being dependent on the guidance and encouragement of a competent other, as also seen in the frequent use of social referencing at this age. Intrapersonal regulation is still, to use Vygotsky’s terminology (Vygotsky, 1998, p. 201), their zone of proximal development and not yet their zone of actual development. The zone of proximal development refers to that level of development in own actions that a child attains only when cooperating with a (trusted) competent interaction partner; the zone of actual development refers to that level that the child can attain alone without external support or the presence of others (see Griffin & Cole, 1984).

Strictly speaking, we can only tell whether a child is capable of completely autonomous intrapersonal regulation when he or she is alone and going through an emotional episode without fetching social assistance. This autonomization process can be divided into three stages:

1. Initially, infants generally do not remain alone at all. They need their caregivers to be available even when currently engaged in other activities and not interacting with them. However, everything has to take place within the same room. Should their intrapersonal regulation fail, they can fall back immediately on interpersonal regulation with their caregiver.

2. Three- to 4-year-olds may well remain alone for short periods of time and play by themselves. However, when they experience an emotion, they seek social support. Hence, their emotion does not trigger problem- or emotion-focused coping actions, but social-focused ones. Their actions are directed
FIGURE 4.2. Type of coping actions triggered by disappointment in solitary situation from the ages of 4 to 6 years ($n = 18$).

toward first making contact with a (familiar) interaction partner who can help them to cope with the emotion episode.

3. As intrapersonal regulation becomes increasingly confident and autonomous, children start to seek less social participation and support. Instead, they can experience an emotion episode alone.

We have studied this increasing autonomization over the preschool years in two of our own studies. As 3-year-olds so frequently refused to be left alone in our pilot studies, we started off with 4-year-olds. In a cross-sectional study, members of three 20-participant groups of 4-, 5-, and 6-year-olds respectively (with equal gender participation) each received a coin that they could use to fetch a candy packet from a slot machine (Holodynski, 1997, Study V). The children were alone, and the candy packet was empty. On a bipolar rating scale with the poles joy and disappointment, 80.7% of all children reported being disappointed. At the same time, the social-focused actions (looking for the experimenter) declined from 8 (47.1%) in the 4-year-olds and 8 in the 5-year-olds to 2 (10.0%) in the 6-year-olds, $\chi^2(2) = 6.85, p = .033$. The children then received a second coin and collected a second packet that was full of candy. All children reported joy. The social-focused actions declined from 15 (78.9%) in the 4-year-olds to 4 (23.5%) in the 5-year-olds and 2 (10.0%) in the 6-year-olds, $\chi^2(2) = 21.80, p < .001$. 


These results could also be replicated in a longitudinal study of 8 boys and 10 girls (Holodynski & Upmann, 2003b) exposed to the same research design once a year at the ages of 4, 5, and 6 years. With increasing age, the children responded less and less to the inductions of joy and disappointment by seeking the experimenter and demanding support in solitary situations. For disappointment, social-focused actions declined between the ages of 4 and 6 years from 8 (44%) to 0 (Cochran’s Q test: $Q(2) = 9.46, p = .005$) and from 9 (50%) to 3 (17%) for joy (Cochran’s Q test: $Q(2) = 5.64, p = .072$). In contrast, problem-focused actions in response to disappointment (e.g., persisting on the task, waiting for the experimenter) increased from 4 (22.2%) to 11 (61%) (Cochran’s Q test: $Q(2) = 4.63, p = .099$). Emotion-focused actions (e.g., making fun of the situation, controlling expression, or shifting attention) did not increase significantly (see Figure 4.2).

For ethical reasons, the causes of emotions in our studies were relatively harmless. Hence, results only generalize to weak emotional intensities in solitary situations. We assume that 6-year-old children will still seek social participation when emotions become more intense, just like adolescents and adults still do when they feel overwhelmed by the intensity of an emotion episode and seek social support.

The Internalization of Cultural Norms through Self-Evaluative Emotions

Self-evaluative emotions permit children to relate themselves not only to objects and persons but also to the norms determining social life. Even a fully autonomous intrapersonal regulation continues to be embedded in a social context without which successful actions would be impossible. In the end, autonomous action functions only because of the existence of cultural norms that people generally comply with. This is what makes social coordination predictable and one’s own activity something that can be planned.

Individuals use self-evaluative emotions to assess their actions in relation to cultural norms. They feel pride when they find themselves in tune with them; shame or guilt when they violate them (Barrett, 1995); and indignation—as a special form of anger—when others disregard them (Mascolo & Griffin, 1998a).

Such self-evaluative emotions guarantee that a child’s intrapersonal regulation remains embedded within the broader social coordination of individual actions and life plans and does not develop in opposition to them. This embedment of the child’s newly awakened will within the social coordination of motive satisfaction is a highly significant developmental task. It leads to the emergence of a new balance on the emotional and motivational level between the newly awakened striving for autonomy on the one side and the need for relatedness, belonging to a social group, and feeling at home there on the other (see Oerter, 1999). Because self-evaluative
emotions play such an important role in development, we shall now address the emergence of pride and shame in more detail.

The emergence of these self-evaluative emotions also seems to possess a zone of proximal development. Our own studies (Holodynski, 1992, 2003a) have shown that infants and preschoolers initially experience pride and shame only in social interaction with an adult. When, in contrast, they are alone, they exhibit only effect-oriented emotions such as joy, frustration, or disappointment. It is only as they advance through elementary school that they also start to react with pride and shame when they are alone—just as adults do. Young children, accordingly, still require social interactions in which an adult represents norms through his or her presence if they are to experience pride over a success rather than joy over an effect, shame over a failure or a moral transgression rather than disappointment, or frustration over an unsuccessful effect (see also Stipek, 1995).

We assume that self-evaluative emotions also emerge through the interplay between affect mirroring by caregivers and motor mimicry by infants (see Section 4.2.1). In coregulation with their child, caregivers establish emotion-specific contingencies between cause, social evaluation, expression reactions, body reactions, and actions. They mirror infant expression reactions in their own expression, and they present expression signs in their own behavior as models. This affect mirroring coincides with the infant sensitivity for contingencies and their ability to “pick up” the feelings of their partner through motor mimicry.

The emergence of self-evaluative emotions depends decisively on how caregivers communicate their approval and disapproval toward their child and his or her actions (see also Stipek et al., 1992; Trudewind, Unzner, & Schneider, 1989). This process can be depicted in four phases.

**Phase 1: The informative and affective impact of social evaluation.** During the second year of life, children pass a major developmental milestone: They learn to differentiate consciously between self and other. They become aware of themselves as acting subjects with their own intentions and expectations and are able to distinguish their own intentions and expectations from those of others. This ability manifests in the use of the word “I.” Stern (1985) calls this the birth of the verbal self. The production of self-caused effects becomes a strong motive, namely, wanting to do things oneself (Geppert & Küster, 1983). During this stage, the desire to do things oneself is not yet directed toward the parental reaction, but still exclusively toward the physical effect that it can produce. The effect has to be immediately perceivable in order to elicit joy when effects succeed, and frustration or disappointment when they fail.

There are many ways in which caregivers can involve themselves in this process and encourage the gradual emergence of self-evaluative emotions in the child. Harter (1978) has pointed out that social evaluation does not just have an incentive impact in the sense that the child anticipates reward or punishment. It also has an informative and affective impact. At this stage of development, social
evaluation is still a means of orienting and directing children’s desire to do things themselves and not yet an incentive that they strive toward for its own sake.

The informative impact of social evaluation is that approving (but also disapproving) certain infant actions or action outcomes marks them and makes them stand out for the child. Caregivers focus particularly on those action outcomes they consider worthy of praise because they comply with cultural norms or represent culturally valued achievements.

Many of these outcomes are so unspectacular in terms of their physical effects that they would never hold the child’s attention by themselves. However, from the parents’ perspective, they mark the gateway to the complex universe of increasingly difficult cognitive or behavioral tasks that are important for the child’s further development. For example, the first time a child manages to complete a simple jigsaw puzzle does not produce any particularly strong personal effect. The child lacks the experience to see that putting together puzzles is a perceptual achievement, and that the simple puzzle marks the gateway to a complex world of challenging tasks and achievements.

However, for adults it marks the beginning of a major new development. They generally express this perception by linking together the infant performance and the performance of “grown ups.” The child can now do something that adults do. This shifts attention from the things to the persons who do something particular with these things, and signals to the child that in this aspect, he or she is already like an adult. When caregivers consistently mark such initially unspectacular action outcomes through their approval, contingencies emerge for the child between his or her actions and parental reactions. The child notices that certain actions can elicit emotional effects in adults.

The affective impact of social evaluation is that caregivers communicate their approval through exaggerated expression signs of pride. They do not just react to the achievement with smiles and joyous vocalizations, but also with exaggerated expression signs of admiration and self-presentation: They puff out their own chest and utter exaggerated cries of admiration. They get the child to show them what they have achieved and encourage the child to stand up tall and feel like a grown up. Because of their motor mimicry ability, children can attune to these expression signs and “catch” the pride—even though, at first, they may not really know what they should feel “proud” about. The evaluation of the caregiver has an affect-contagious impact.

Hence, the effects marked by adults have the pleasant effect of stimulating a socially evaluative form of an effect-related joy in the child. This differs from a “simple” effect-related joy. In the latter, joy is directed toward the effect, whereas in the effect elicited by social evaluation, the caregiver places the child and his or her achievement at the center of attention. The child becomes the object of overt attention in order to emphasize that, at this moment, he or she has surpassed his or her actual level of development and done something in the same way as grown ups.
CHAPTER 4

do. Such a new person–environment relation lends itself to being coded iconically in expression signs of self-expansiveness characteristic for pride such as standing up straight, smiling broadly, and making celebratory gestures (see Barrett, 1995; Mascolo & Fischer, 1995).

Social exclusion as the origin of shame. The negative side of social evaluation is disapproval. It leads to the emergence of the negative self-evaluative emotions of shame and guilt. These appear in conflict situations when children’s wanting to do things themselves runs up against the decisive disapproval of caregivers, because they are either doing something or want to do something that they should not do, or they should do something that they already can do in principle, but do not want to do in practice.

In the first case, caregivers confront children with the normative prohibition that one is not allowed to do everything that one can do, for example, smearing paint all over the wallpaper. This is a situation in which children have to inhibit their own action impulses. If they defy the prohibition, caregivers can take advantage of their greater strength and reach by, for example, removing the paints. Children may well protest, but the situation is definitely defused.

This approach is ineffective for the second form of conflict—over normative commands—when children should do something that they can do, but do not want to do. These are actions that children have already mastered. However, they should no longer just carry them out when they feel like it, but in a norm-driven form, for example, eating by oneself with a spoon without making a mess. However, children may prefer using the spoon to play with their food, because this produces far more interesting effects. Indeed, there are hardly any limits to children’s desire to do things themselves.

Caregivers, however, pose limits. As children gain autonomous mastery of certain abilities, particularly in looking after themselves, caregivers switch sooner or later, more or less gently, to no longer viewing them as babies in need of care, but as children who can already do things, and, therefore, should also do those things they are capable of. Hence, they confront children with the demand to be like grown ups, like “big” children, and also behave as such—even though, at the present time, the children do not want to behave in this way.

This conflict becomes critical when the emergence of the conscious self–other distinction allows children to recognize when their own intention is being inhibited or even thwarted by that of another person. Because they are aware that the other person wants something different from what they want, it is no longer so easy to apply the simple strategy of distracting them from their intentions. From the children’s perspective, there is no reason to desist from what they are doing. Indeed, their anger over the parental goal blocking grows into massive bouts of defiance aimed at forcing caregivers to relinquish their own goals instead.

At this stage, “negotiation” is not yet possible, because it would require symbolic regulation strategies that children of this age still do not possess (see
below). Hence, caregivers cannot appeal to “reason” in their children, to their conceptual insight into the legitimacy of the demanded norm, even when many mothers and fathers attempt this—without success—in daily childrearing.

When all “well-intentioned” strategies fail, what “final” means can caregivers apply to make their children drop their intentions and do something that they can do, but do not want to do, although they should do? The means is to break off the relationship, either by leaving children alone or literally putting them outside the door—to exclude them socially, and thereby give them to understand that they have made themselves unlikable.

But, why is such exclusion so effective? To understand this, it is necessary to take the children’s perspective. They do not initially see exclusion by one’s caregiver as being something temporary but as something permanent and fundamental. They correctly infer that they have been excluded intentionally. At the same time, the person excluding them is also the person to whom they have always been able to turn for support in difficult situations. Their attachment motive is activated to a high degree, but it is precisely the target person of this attachment that refuses all help. This is what makes exclusion by the caregiver such an existential experience. Children are helplessly alone in this situation and experience themselves as objects of a parental “despotism” directed toward their person as a whole. The child is excluded as a person. Children’s reactions are correspondingly vehement in that they bitterly petition for the attachment to be reinstated through hefty, stubborn, or pleading protest.

Sooner or later, caregivers allow their child to return. The intensity of a child’s powerlessness in the face of the respected other depends on the extremity of the exclusion and the warmth or coldness of the way in which the caregiver resumes the attachment relationship. This can range from a warm-hearted reconciliation with comforting to a more rejecting, mere tolerance of the return. Essentially, however, the child has had to experience that he or she was small, rejected, and powerless in relation to his or her caregiver in this situation.

It is unclear how many such exclusion episodes children have to go through before they can extract the experience that they are no longer accepted unconditionally but have to meet the normative demands of their caregiver. This is the only way to regain approval—otherwise, subjectively, they are faced with the threat that the relationship will break down (see also Barrett, 1995, p. 47; Buss, 1980; Lewis, 1971).

We assume that such exclusion experiences form the basis for the emergence of shame. Buss (1980, p. 157) interprets shame as social anxiety, as a fear of social expulsion, of being abandoned by one’s parents. Lewis (1971) talks about shame as the fear of losing parental love and approval (see also Piers & Singer, 1953; Wurmser, 1981).

After experiencing such exclusions, the caregiver often has to only threaten renewed exclusion when children once more either violate or fail to comply with a
norm. Children promptly feel themselves to be the focus of a disapproving evaluation of the self, and will try to evade the threatened exclusion through expression signs such as averting their gaze, burying their head in their hands, hunching themselves up to make themselves look small, and hiding. We think this is the **intrapersonal** regulation function of shame-related expression signs (see Barrett, 1995, p. 42). At the same time, such expression signs can also be interpreted as gestures of appeasement toward the caregiver. This is because children use their expressive behavior to portray a self-exclusion iconically, so that caregivers no longer have to resort to actual exclusion. We think this is the **interpersonal** regulation function of shame-related expression signs. Because shame is a special form of anxiety, fear-related body reactions also appear (see, once again, Barrett, 1995, p. 42).

In one way or another, all children must have gone through the experience that their defiant or stubborn wanting to do things themselves can lead to exclusion or a break in the relationship with the caregiver when it violates normative standards. As a result, they will react to comparable disapprovals in subsequent situations with shame.

A similar and effective method of inducing shame is to ridicule children for their norm violations. This leads to the insight that the way they are behaving at the moment is not adult-like at all, but still like a silly baby. Such ridicule is also a form of social exclusion to which children react with shame.

**Phase 2: The search for positive social evaluation.** As discussed in detail above, the informative and the affective impact of social approval introduces a new aspect to wanting to do things oneself: wanting to do that which caregivers or adults in general approve of and thus triggering a positive social evaluation in adults. This splits wanting to do things oneself into two different motives: The first continues to be oriented toward a material effect. In line with White (1959), it can be called the effectance motive. The other is oriented toward a social effect and adopts the content of the social norms and regulations. This form of motive can also be called the identification motive—wanting to be like the respected adult (see Holodynski, 1992). In the terminology of a self-theory, it can be equated with the formation of the ideal self (Allport, 1937; Erikson, 1973).

The autonomy of these two motive forms can be seen when children shift to testing what effects these positive evaluations can trigger in adults. This leads to the typical young child behavior of wanting to show off everything to adults—in anticipation of a positive evaluation. Social evaluation has developed an **incentive** function (see Harter, 1978). During this testing process, the first positively weighted norm standards crystallize for the child—what caregivers consider to be admirable and what children are spurred to achieve.

For children, this is accompanied by a further “discovery”: Whereas they were initially fixated on the functional properties of daily objects (What can you do with it?), they now discover increasingly that objects and the actions linked
to them can be joined together to form action scripts that then belong to certain adult roles. Children start to acquire the world as a world of social roles: Mother feeds and looks after her baby, the baker bakes bread, the doctor heals the sick, and so forth. These discoveries also make children aware of the norms and rules of a cultural community. They are reflected in role-related action scripts and are enacted in children’s role-play (see Elkonin, 1980; Oerter, 1993).

**Phase 3: Pride and shame as self-evaluations requiring a social context.** When children no longer wait for evaluation by adults, but react immediately to a success with pride or to a failure with shame, they are already evaluating their activities according to normative standards. This is then no longer a response to the explicit approval or disapproval of caregivers, but an anticipation of these reactions. In a study of performance-related tasks, Stipek (1995; Stipek et al., 1992) found that 3-year-olds already exhibited shame-related reactions (e.g., gaze aversion; avoidant posture such as head and chin down, body to one side, or squirming; closed posture such as arms/hands in front of face, shoulders hunched) more often in response to failures than to successes, and pride-related reactions (e.g., open posture such as hands or arms up, head or chin up, “puffed chest,” sitting up tall) more often in response to successes than to failures. However, no developmental trend in the intensity or frequency of these reactions could be observed from the third to the fifth year of life. Therefore, Stipek (1995) concluded that even 3-year-olds have already internalized normative standards: “Self-evaluative emotions . . . become independent of the anticipation of others’ approval or disapproval” (p. 249).

We consider such a conclusion to be premature. An experimenter was always present in these sessions, so the children’s pride and shame reactions need not have been triggered by an internalized self-evaluation. They could also have been induced by the presence of the adult. To test whether self-evaluation is independent of social context, that is, whether children comply with norm standards for their own sakes rather than for those of others, it would be necessary to analyze task behavior in solitary situations, that is, isolated from all social interaction. If preschoolers then still react to their successes or failures with pride or shame respectively, this could be interpreted as clear confirmation that competence-related self-evaluations can already be performed at this age without the mediation of social processes.

An inspection of the literature on the origins of self-evaluative emotions reveals that all studies used exclusively social situations. They either studied competitive behavior—an intrinsically social setting (Heckhausen & Roelofsen, 1962)—or experimenters were present, and the children had to show them whether they had been able to master the task (Lewis, Alessandri, & Sullivan, 1992; Schneider & Unzner, 1992; Stipek et al., 1992).

This deficit led us to study solitary situations (Holodynski, 1992). We gave Heckhausen and Wagner’s tower-building task (Heckhausen & Wagner, 1965) to
18 female and 17 male preschoolers (M = 62.0 months, SD = 10.1 months). In this task, children had to build towers of a given height with wooden blocks, and they had to do this not only in the presence of the experimenter but also alone. We recorded how far the children exhibited pride-related expression signs (open posture such as raised head, “puffed chest,” sitting up tall; gestures of triumph such as hands or arms up, cries of triumph) or shame-related expression signs (avoidant posture such as head and chin down; closed posture such as arms/hands in front of face, shoulders hunched, pressed lips, biting lips, averted gaze, fumbling gestures). Thirteen children (37%) displayed pride when building a tower successfully or shame when it collapsed only in the social situation when the experimenter was present. Only one child did this in the solitary situation. This does not support a self-reference of pride and shame in this age group.

Twenty-two children (63%) reacted with neither pride nor shame; they displayed joy, embarrassment, anger, or disappointment. Therefore, a second experiment was performed in which an emotional self-evaluation regarding the task was encouraged systematically through performance-related behavior in the experimenter, and a less effect-oriented task was selected—using jigsaw puzzle pieces to assemble squares of ascending difficulty (Holodynski, 2003a). From 38 children (M = 61.5 months, SD = 10.3 months), 26 reacted with pride (68%) and 15 with shame (39%). Only 5 children (13%) displayed neither of these two emotions. This confirmed that the children already reacted to the task with self-evaluative emotions. In the subsequent main study, children had to solve another set of square puzzles: once by themselves in a solitary condition, and once in the presence of an experimenter who watched the child in a reserved, neutral way. Two of the puzzles were impossible for the children to solve. After each child had made a few unsuccessful attempts, the experimenter asked: “Can’t you do it?” In the solitary condition, only 3 (7.9%) of the 38 children displayed pride at their success and 2 displayed shame at their failure. The others displayed effect-oriented emotions such as joy, anger, or disappointment (see Table 4.2). In the social condition, in contrast, 22 children (57.9%) responded with pride and 26 with shame (68.4%).

These findings indicate that preschool-age children initially display the self-evaluative emotions of pride and shame almost exclusively in the presence of other persons. At this age, norm standards do not seem to have attained the necessary degree of detachment from direct social interaction with a respected person that would enable them to be effective on their own. Young children still require adults as living representants of standards, and they wish to demonstrate their own ability to meet these standards. Self-evaluative reactions with pride or shame still belong to the zone of proximal development and not yet to the zone of actual development (Vygotsky, 1998, p. 201).

Phase 4: Pride and shame as internalized self-evaluations. An internalized self-evaluation in which children react with pride and shame for themselves alone first seems to develop during elementary school age and not as early as the third
year of life as claimed by Stipek (1995). Thirty of the 38 preschoolers in our experiment (Holodynski, 2003a) described above were followed up with similar square puzzles 2.5 years later when attending elementary school (M = 94.0 months, SD = 11.9 months). In the solitary condition, 7 children (23%) now displayed pride when successfully solving a puzzle and 15 (50%) displayed shame when they failed. In the social condition, 27 (90%) children displayed pride; 29 (97%), shame (Holodynski, 2003b).

Accordingly, it was only after entering elementary school that children started to react more frequently to success and failure with self-evaluative emotions in solitary situations as well. That this transition to elementary school is accompanied by an internalization of norms and thereby a genuine self-evaluation is not surprising. This is the first time children are confronted systematically with achievement measures—at least in Germany—and they also compare each other’s achievements so that success and failure become meaningful to them.

Of course, the things they are either proud or ashamed about become more differentiated over the next years of life. Mascolo and Fischer (1995) have addressed this topic and conceived a developmental sequence in the appraisal patterns of pride and shame.

Finally, one special case of norm violation is when children cause injury to another person through their behavior. Caregivers may differ in how they react to such situations: They may focus the child’s attention on the injury and the negative feelings (sadness, pain) that this has triggered in the injured party and take measures to make reparation. Such strategies should tend to favor the emergence of guilt (see Barrett, 1995). However, they may also focus on the norm violation, particularly when it has been carried out intentionally, and threaten the child with social exclusion. Then, such episodes should tend to elicit more shame.
Summary. The process by which pride and shame emerge can be broken down into four phases: In the first phase, children display only effect-oriented activity and effect-oriented emotions of joy over an intended effect and frustration or disappointment over an unsuccessful effect. During this phase, caregivers introduce normative standards into their interaction with the child through their reactions of approval and disapproval. This makes children aware of the reactions that their effect-oriented actions trigger in caregivers: vicarious pride reactions for norm-attuned behavior (including the attainment of competence standards) and social exclusion for norm-violating behavior. These experiences lead into a second phase in which young children direct their actions toward triggering approval in their caregivers. When behavior violates norms, threatening the child with social exclusion is sufficient to activate the social fear that this will reoccur. In the third phase, norm standards have become internalized to such an extent that the presence of a respected other, particularly an adult, is sufficient to elicit pride or shame at norm-appropriate or norm-violating behavior respectively. It is only in the fourth phase during elementary school age that children seem to internalize norm-oriented behavior to such an extent that they react to norm-relevant action outcomes with pride or shame in front of themselves—or, at least, in front of an imagined other—but without requiring the real presence of that other.

4.3.2. The Emergence of an Intrapersonal Volitional Action Regulation

The transition from using language as an interpersonal means of regulation to using it as an intrapersonal, self-referring one is a complex and multitiered process (see Luria, 1980). Within our context, we shall focus only on that development trajectory in which speech signs can acquire an action-regulating function—an aspect that becomes decisive for the volitional control of emotional action readinesses (see Section 4.3.3). It is decisive, because it takes time for children to acquire the ability to stick to an intended plan in the face of adverse conditions and existing emotional action readinesses and to correct impulsive actions through self-instruction. It is only during preschool age that they become able to inhibit their own behavior through language. Hence, a tiresome learning process is needed before the meaning of what is spoken actually impacts on action, and verbal instruction becomes an effective regulator. Luria (1961, 1980) distinguished three stages of development in his studies.

External instruction as an impulse to initiate action. The previous section (see 4.2.2) showed that 2-year-olds are still unable to inhibit action readinesses on the basis of verbal instruction. At this stage, speech serves as an action-initiating appeal to others that is associated only vaguely with the meaning of what is spoken. External instruction, that is, verbal instruction, seems to be able to only trigger reactions in children of this age. It cannot inhibit them or regulate their course without the support of situational or action cues (Luria, 1961).
Self-instruction as an impulse to initiate action. Luria (1961) extended his light signal experiment (see Section 4.2.2) to cover self-instructions in 3- to 4-year-olds (see Figure 4.3). The children had to squeeze a rubber ball for a red light signal and not squeeze it for a green one. In Condition A, children did not give themselves self-instruction. As a result, they made a lot of errors. In Condition B,

FIGURE 4.3. Impulse-controlled inadequate squeeze reactions (errors marked by arrows in conditions A, B, and D) to light signal by Gena P., 3 years, 7 months. Condition A: No self-instruction—squeeze for red; don’t squeeze for green. Condition B: The same reinforced with twofold self-instruction—squeeze and don’t squeeze. Condition C: Adequate reaction to only positive command—squeeze for red. Condition D: Reaction with no spoken command—inadequate reactions return. Adapted from Cole, 1978, p. 253.
children had to give themselves a twofold self-instruction, namely, the initiating instruction “squeeze” for a red light and the inhibitory instruction “don’t squeeze” for a green light. Results showed that the “don’t squeeze” instruction also led to regular ball squeezing. Only the simple action-initiating command to “squeeze for red” in Condition C led to optimal regulation. When spoken commands were dropped once more in Condition D, the error rate rose again.

This shows that 3- to 4-year-olds are clearly able to initiate motor reactions through their own speech. However, here as well, speech initially serves only as an action readiness, because the inhibitory self-instruction “don’t squeeze” also triggers the squeezing response.

Self-instruction as meaning-controlled action regulation. This is the stage at which attention is also paid to the meaning of speech signs without the need for situational or action cues, and it becomes possible to inhibit action through speech. The meaning content of self-instruction acquires its action-regulating function at the age of 5–6 years. When children of this age were given the experimental condition with the twofold instruction described above, they frequently formulated the task in their own words as: “If the red light comes on, I have to squeeze the ball; if the green one comes on, I mustn’t squeeze it.” After a short time, they were able to perform the reaction (and also its inhibition) correctly without continuing to speak out loud. A new volitionally generated routine action had formed. Adults also still resort to speaking out loud to regulate their actions when they have to perform complex action chains such as following instructions in a user manual or learning to drive an automobile.

Speech signs become more important in interpersonal regulation as well, because children increasingly have to use them to help deal with tasks that they previously tackled with expression signs. Sooner or later, caregivers encourage their children to start to formulate their appeals verbally rather than continue to use expression signs. Instead of sticking out their hand for a biscuit and whining loudly, they are now expected to express a verbally formulated request. Infants shift increasingly to expressing their wishes and intentions through speech. Kopp (1992) has plotted this transition in terms of the reduction in crying between the ages of 1 and 4 years. One can also view this transformation of expression signs into speech signs as a form of emotion regulation, because children are encouraged to modify the expression components of an emotion (see Thompson, 1990).

### 4.3.3. The Emergence of an Intrapersonal Reflective Emotion Regulation

Between the ages of 3 and 6 years, children also pass a major milestone in the development of their reflective emotion regulation. Increasingly, they become able to inhibit a currently pressing emotional action readiness volitionally and not pursue it here and now but at a later and more suitable time. This ability to engage in
reflective emotion regulation is essential for adult motive satisfaction. As already noted at the beginning of Section 4.3, most motives cannot always be satisfied in the here and now. One has to seek out suitable situations, wait for the appropriate moment, reach an agreement with the other persons necessary for motive satisfaction, and defer one motive in favor of another. In some ways, one can view all development up to adulthood as a continuous postponement of motives and their attendant emotional action readinesses: Children have to learn to wait until it is their turn, until they are given the object they desire (at Christmas or on their birthday), or until they are old enough.

Prototypical situations of this kind are when children are required to delay gratification. Mischel and colleagues (Mischel, 1971; Patterson & Mischel, 1976) were among the first to study this ability systematically. They used an experimental paradigm in which children could receive either a small reward immediately or a large reward after a waiting period. The children began to choose to delay gratification and stick to their choice only when they were about 4 years old. When asked, even preschool-age children knew that delaying gratification really was the “cleverer choice,” but the majority still tended to prefer the smaller but immediate reward (Nisan & Koriat, 1977).

A follow up of these 4-year-olds at the ages of 15 or 18 years showed that those who had already been able to “resist temptation” as preschoolers were more socially competent as adolescents than the one third of the children who succumbed. The former could tolerate more frustration, were more self-confident, and also had better school grades (Shoda, Mischel, & Peake, 1990). This shows how important reflective emotion regulation is in ontogenetic development.

Development of behavioral regulation strategies. Which regulation strategies do children apply in order to delay gratification, and which age-specific changes can be observed?

Bridges and Grolnick (1995) studied five age groups (12, 18, 24, 32, and 45 months) in two situations with delay of gratification. One promised a much-loved snack (an animal-shaped cracker) and the other an attractively wrapped present. However, the children always had to wait before receiving the “desired” object. The experimenter made an excuse to leave the room and placed the object in sight of the child but out of reach. Although the mother remained in the room, her availability was varied. In a passive condition, she was asked to busy herself by reading a magazine; in an active condition, she was not busy and available to her child.

With increasing age, children more frequently used self-initiated intrapersonal distraction strategies such as playing with other objects, particularly when the mother was unavailable. Thirteen percent of the 12-month-olds, 25% of the 32-month-olds, and 65% of the 45-month-olds exhibited such strategies. Self-initiated interpersonal distraction strategies in which the child engaged the mother in play or conversation (by smiling, showing her toys, or asking her to play) also increased markedly, particularly in the active condition in which the
mother was available. These increased from 1% of the 12-month-olds to 4% of the 32-month-olds and 25% of the 45-month-olds. In contrast, calming strategies in which the children sought consolation and support from their mothers decreased in the passive condition from 28% in the 32-month-olds to 1% in the 45-month-olds (see also Table 4.3).

Hence, between the ages of 1 and 4 years, children increasingly apply distraction strategies by themselves, and by the age of 4, they are also able to vary them context-specifically. When their mothers are busy, they direct far fewer interpersonal distraction strategies toward them and apply more intrapersonal distraction strategies than when their mothers are available. Stansbury and Sigman (2000) showed that these age-specific changes do not just apply to situations with delayed gratification but generalize to other causes of negative emotions. They also found that children favored the regulation strategies preferred by their mothers. This points to the existence of dyad-specific learning processes.

We have still not considered how successfully the children’s strategies regulate their own emotions and also lead to the desired goal. We tackled this question in our own study by assessing not only the child’s regulation strategies but also the course of the emotion (Friedlmeier & Trommsdorff, 2001).

We observed 2-year-old ($n = 20$) and 3-year-old ($n = 35$) girls in a mother–child interaction in which we induced a “frustration situation.” A stranger entered the room, removed the toy the child was playing with, and left the room again. We assessed the intensity of negative emotional expression by rating facial expression, gestures, and body posture on a 6-point scale at four time points: (1) before the removal of the toy (baseline), (2) 10 s after the removal of the toy, (3) 1 min later, and (4) 2 min later. After 2 min, the experimenter returned and gave the toy back to the child. Furthermore, maternal sensitivity was operationalized as an aggregated measure of maternal warmth and maternal responsiveness, which were assessed by a 6-point-scale each. Both scales were highly intercorrelated in both groups. A median split was calculated for each age group in order to differentiate between high and low sensitive mothers.

The children’s regulation strategies were assessed in another observation situation in which the children experienced the mishap and the sad reaction of their play partner. In this situation, the mothers were instructed to remain passive so that, in contrast to the frustration situation described above, the child would have to take the initiative. Three types of strategy were discriminated: seeking physical closeness to mother, making eye contact, and seeking no support from her. The first two forms were viewed as an interpersonal regulation initiated by the child; the latter, as an intrapersonal regulation.

The proportion of children exhibiting exclusively intrapersonal strategies tended to be higher in the 3-year-olds compared with the 2-year-olds. However, the interesting question was whether children using intrapersonal regulation would differ in the way they reacted to the frustration situation.
### TABLE 4.3. Type of Reflexive Emotion Regulation Strategies and Who Can Initiate Them

<table>
<thead>
<tr>
<th>Initiator of the emotion regulation</th>
<th>Caregiver (CG) initiates interpersonal regulation for child</th>
<th>Child initiates interpersonal regulation by CG</th>
<th>Child initiates intrapersonal regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of strategy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavioral strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touch</td>
<td>Rocking, stroking, comforting mode of speech, body contact</td>
<td>Child seeks closeness to CG in order to be comforted</td>
<td>Child calms self through such actions as sucking, stroking, or hugging self</td>
</tr>
<tr>
<td>Distracting attention</td>
<td>Shifting attention to another object</td>
<td>Child asks CG to play</td>
<td>Directing gaze away from source of arousal, child turns to another object, goes off to play</td>
</tr>
<tr>
<td>Flight, withdrawal</td>
<td>CG removes child from the situation</td>
<td>Child appeals to CG to be taken out of situation</td>
<td>Child flees from the situation, also social withdrawal</td>
</tr>
<tr>
<td>Comforting, consoling</td>
<td>Verbal consoling and comforting</td>
<td>Verbal request to be consoled by CG</td>
<td>Child calms self through (positive) self-instruction</td>
</tr>
<tr>
<td>Distracting attention</td>
<td>Talking about something else</td>
<td>Child changes the topic, poses questions on other topic</td>
<td>Child distracts self with thoughts, e.g., thinks about something attractive</td>
</tr>
<tr>
<td>Reinterpreting (e.g., trivializing, downward comparison, rejection of guilt, denial)</td>
<td>Reinterpreting the emotion episode, giving a plausible explanation</td>
<td>Child asks CG questions about emotion episode, seeks an explanation, initiates role play</td>
<td>Child personally reinterprets emotion episode in role play and fantasy</td>
</tr>
<tr>
<td>Ranking motives in time hierarchy</td>
<td>Parents put off gratification of child’s motive to later point in time</td>
<td>Child appeals to CG to promise later gratification of motive</td>
<td>Child imagines gratification of motive at later point in time</td>
</tr>
<tr>
<td><strong>Antecedent strategies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approach</td>
<td>Providing positive emotion episodes</td>
<td>Child requests CG to provide positive emotion episodes</td>
<td>Child seeks out positive emotion episodes</td>
</tr>
<tr>
<td>Avoidance</td>
<td>CG protects child from potentially negative emotion episodes</td>
<td>Child asks CG about the negative valence of situations</td>
<td>Child avoids potentially negative emotion episodes</td>
</tr>
<tr>
<td>Discourse over the regulation of emotions</td>
<td>CG talks to child about emotions and their regulation</td>
<td>Child asks about emotions and their regulation</td>
<td>Child thinks about potential emotion episodes</td>
</tr>
</tbody>
</table>
Although the 2-year-olds showed no differences, the 3-year-olds did: Girls using interpersonal regulation showed more intensive emotional expression and took longer to recover than those using intrapersonal regulation.

The assumption that interpersonal regulation continues to be dominant in the 3-year-old girls and is also the age-appropriate strategy would have led us to anticipate the opposite. This outcome can be interpreted in one of two ways: (1) Interindividual differences of the children cause the effects: Three-year-olds who still seek closeness to mother find it difficult to regulate their emotional reaction appropriately and are also less easy to calm. (2) Interindividual differences in the mothers’ childrearing styles cause the effects: Mothers of 3-year-olds who regulate interpersonally encourage a frank exchange over the cause of the frustration situation and the emotion it triggers, leading to a greater persistence of the negative expression over time.

This second interpretation is supported by the finding of a relation between the sensitivity of the caregiver and the child’s emotions (see Figure 4.4): Whereas the initial emotional intensity was comparably strong, it declined far less in girls with sensitive mothers than in their peers with less sensitive mothers. In dyads with less sensitive mothers, a stronger effort was made to dispel a negative emotion rapidly.

**FIGURE 4.4.** Temporal course of negative expression intensity (1 to 6 maximum) in 2- and 3-year-old girls as a function of the sensitivity of their mothers. Adapted from Friedlmeier & Trommsdorff, 2001.
In contrast, more sensitive mothers focused more attention on the negative emotion of their child, and it subsided more slowly (Friedlmeier & Trommsdorff, 2001).

Further support for this interpretation is provided by an analogue observation of mother–child interaction in 5-year-olds (Friedlmeier & Trommsdorff, 1999) in which children were exposed to the frustration situation described above, and their mothers’ regulation behavior was coded. Compared with less sensitive mothers, sensitive mothers focused less on letting the frustration subside but dealt extensively with its cause and the child’s emotional reaction (see Section 5.2.3).

This type of approach can also be viewed as an affect mirroring of children’s emotions by their mothers. The emotions are not just mirrored with the help of expression signs but also with the help of speech signs. By not just regulating their children’s emotions “away,” but by using them as an opportunity to talk about emotions, children gain an opportunity to become aware of emotional causes, types of expression, consequences, and regulation strategies, and they can forge a link between volitional and emotional action regulation. Gottman (1997) recommends this style in his parental childrearing manual and calls it “emotion trainer.” In their longitudinal study, Gottman, Fainsilber Katz, and Hooven (1997) showed that parents practicing such a childrearing style had children with a greater knowledge of emotions at their disposal, were more emotionally well-balanced, and were more popular with their classmates (see below).

**Development of symbolic regulation strategies.** Even at an early age, children already apply distraction strategies in order to master a delayed gratification. However, this often requires such a great volitional effort that they are unable to do anything other than wait and try (more or less successfully) to distract themselves.

One particularly successful regulation strategy for overcoming motive conflicts and waiting situations is the ability to engage in “mental time travel” and perform a temporal ranking of motives and emotional action readinesses (see Bischof-Köhler, 2000). This is understood as the ability to bring to mind past and future motives and to take them into account when organizing one’s actions (see Table 4.3).

Bischof-Köhler (2000) has identified two necessary preconditions for this ability: a theory of mind and a comprehension of time. A theory of mind (see Wimmer & Perner, 1983) includes the knowledge that other persons may have a false belief that does not agree with the facts. It also contains the ability to bring to mind two intentions (one’s own and that of one’s partner) simultaneously and perceive them as differing. Such achievements require the ability to handle reference systems in one’s mind. One has to represent two reference systems at the same time, for example, the situation as actually found and the possibly incorrect notions that a person has of it.

Time comprehension, the second precondition for mental time travel, is based initially, according to Bischof-Köhler (2000), on the application of spatial categories to temporal phenomena (e.g., behind and in front of to before and after)—that
is, the use of space as a model for (invisible) time. Gradually, this makes it possible to relate earlier and current events to each other in the mind.

The temporal conjunction of theory of mind and time comprehension leads to the ability to travel through time in one’s mind and to coordinate one’s actions by ranking various motives and emotions in time. One can satisfy one motive now and the other one later. Nonetheless, purely mental actions is not enough; there is also the need for an “executive control”—a kind of volitional authority that can check readiness- and stimulus-controlled actions and focus attention on planning actions that serve one’s motives. This also includes the development of speech signs as a means of action-regulating self-instruction, as described in Section 4.3.2.

Bischof-Köhler (2000) tested time comprehension and theory of mind in 55 girls and 56 boys aged 3–5 years. To test the former, children had to estimate the temporal duration of action sequences; to test the latter, they had to master so-called false-belief tasks. They also had to perform a task with delayed gratification (waiting for a present) and master a conflict of motives. In the latter, they could apparently choose between catching candies by hand as they came out of a machine at irregular intervals and eating them or going into the next room and watching a cartoon on television. However, they could also place a bowl beneath the candy machine, watch television in the next room, and then come back and empty the candies out of the bowl.

Hardly any of the 3-year-olds possessed time comprehension compared with approximately 90% of the 5-year-olds. There was also an increase in the ability to answer the false-belief tasks correctly from 20% in the youngest to 100% in the oldest. The results on delayed gratification and on the motive conflict task were particularly revealing: Of 21 children who displayed fixed waiting behavior during delay in gratification (staring continuously at the hourglass until the waiting time was over), only 5 (23.8%) possessed time comprehension and a theory of mind.

In contrast, of the 24 children who displayed flexible waiting behavior (distracting themselves in a relaxed way through play and only glancing at the hourglass occasionally), 21 (87.5%) possessed a theory of mind and a comprehension of time. In the motive conflict task, of 56 children using a to-and-fro strategy (moving to and from between candy machine and television and thereby missing both), 19 (33.9%) possessed a theory of mind and a comprehension of time. In contrast, of 45 children applying a planning strategy (using the bowl to catch the candies, calmly watching television, and then emptying the bowl), 32 (71.1%) possessed a theory of mind and a comprehension of time.

Hence, the ability to engage in mental time travel is a reflective strategy for regulating emotional action readinesses that is highly efficient and proves to be a necessary precondition for applying behavioral strategies such as distraction successfully.

Play and emotion regulation. Finally, it should be mentioned that children of this age do not acquire strategies for reflective emotion regulation only as a product
of the direct experience of emotional events. Children can also practice and further refine the use of these strategies in play (Galyer & Evans, 2001). “Pretend” play makes it possible to reinterpret reality in one’s own terms. One can use role-play and construction games, for example, to satisfy unfulfilled motives in one’s mind, to relive impressive experiences, and to reinterpret oppressive experiences so that they lead to a more motive-serving solution (see Oerter, 1993). In rule-governed games, children learn to tolerate and regulate failures and the negative emotions that accompany them.

**How children learn regulation strategies.** Generally, children learn these volitional strategies through parents and friends (see also Friedlmeier, 1999b). Thompson (1990) names four potential paths of learning that emerge in parallel and supplement—but may also contradict—each other:

1. **Direct instructions.** In situations in which children should learn to regulate their feelings, parents use direct verbal instructions such as “calm down” or “stop whining” and demand the child’s compliance.

2. **Proposals for reinterpretating the cause.** When their children need to modify their emotions, parents reinterpret the cause or the situation and get their children to adopt this interpretation—in the hope that this will lead to a change in their emotion.

3. **Model learning.** In their own (more or less commentated) regulation behavior, parents present their children with models of how one can regulate emotions, and their children can try these out and adopt them.

4. **Discourse over emotions.** Parents talk to their children about when to express and experience which feelings in which way, which consequences feelings may have, how one can influence one’s own as well as others’ feelings, and so forth. This enables children to acquire a knowledge of emotions that they can exploit to regulate their feelings (see Gottman et al., 1997; Janke, 1999).

A further path not mentioned by Thompson (1990) involves the role of parents as play partners. One important finding in Galyer and Evans’ study (Galyer & Evans, 2001) was that children who had more opportunities to engage in symbolic play with caregivers exhibited more appropriate expressive behavior in an induced frustration situation.

Families vary greatly in how they apply these strategies. Research has shown that children from families that successfully make these paths of learning available to their children also possess greater emotional and volitional regulation competence than children from other families (see Gottman et al., 1997). Currently, this topic is being discussed under headings such as emotional competence or emotional intelligence (see Goleman, 1997; Saarni, 1999; Salovey & Sluyter, 1997; von Salisch, 2002).
4.3.4. Summary

Compared with the first phase of development in which caregivers are at pains to satisfy emotional reactions and their attendant motives promptly and appropriately, in the second phase, caregivers shift to demanding an increasingly independent regulation of actions and emotions. The developmental tasks for infants and preschoolers impose three demands on them:

1. Children should perform emotional action regulation themselves. They are encouraged to apply the expression signs and coping actions acquired during interpersonal regulation in intrapersonal regulation. Emotional expression should also be understood as an appeal to oneself to carry out the necessary actions alone.

2. Furthermore, children now also have to learn that their current motives cannot always be satisfied right away, but that motive satisfaction has to be coordinated with the social environment. This calls for the ability to rank motives according to their importance, to delay their gratification, or even to drop them completely. Caregivers set behavior standards and demand that infants form new motives directed toward complying with these standards. These new norm-oriented motives also lead to the emergence of new emotions such as pride, shame, or guilt. During such pride or shame episodes, infants experience that they can attain their own individual motives only when they realize that their actions are socially embedded—and take this into account. This represents the ability to view oneself through the eyes of the esteemed other and coordinate one’s own actions with behavioral norms. Such norm-appropriate activity is attained through the emotions of pride and shame that signal compliance with or threat to the self-ideal. It is not yet the product of a voluntary decision based on a conceptual insight into the legitimacy of the norm.

As infancy progresses, children start to orient themselves toward the reactions of adults and to seek positive responses to their successes and avoid responses that threaten them with exclusion, in other words, ones that could lead them to experience shame. Self-evaluation is encouraged through external evaluation with adults functioning as the incarnation of cultural norm standards. By the end of preschool, children have started to internalize this evaluation. They evaluate their performance independently from external judgments and orient themselves exclusively toward their own success or failure.

3. Increasing language competence leads to the demand to start formulating expression signs as verbal appeals. Particularly on the level of reflective emotion regulation, caregivers increasingly apply symbolic strategies, and verbal communication becomes increasingly important for regulation.
4.4. THE INTERNALIZATION OF MENTAL MEANS OF REGULATION FROM AGE 6 ONWARD

Between the ages of 3 and 6 years, children increasingly reduce their dependence on comprehensive support from their caregivers. They can use emotions and volitions to regulate their actions themselves and also, to a limited extent, modify their emotions volitionally. This grants them the fundamental ability to satisfy their motives by themselves and in negotiation with their social environment. An intrapersonal regulation of actions and emotions has become distinct from the interpersonal regulation of actions and emotions. Children can now apply either form of regulation as the context demands.

A major milestone in the third phase of development—starting approximately at the age of 6—is, according to the internalization model, a change in form in the means of psychological regulation (the expression and speech signs) that children apply for intrapersonal regulation. With increasing independence, expression and speech signs adjust to this new intrapersonal regulation function by becoming internalized: Physical expression and speech signs that are perceivable for outsiders (observer perspective) become mental expression and speech signs that, in the extreme case, are only perceivable for the individuals themselves (actor perspective). External actions become internal “as-if” actions in the mind. A mental plane of expression, speech, and action emerges on which individuals act in a mental space, imagine all kinds of scenarios, and can also develop an emotional feeling about such mental scenarios. The means of mental regulation in subjective feeling (i.e., in the actor perspective) retain their similarity to externally perceivable expression, to loud speech, and to real acts.

One central premise of the internalization model is that this formation of a mental plane (the internalization) does not just take place in the domain of speech and action; this internalization also occurs in the domain of emotional expression. Speech signs and also expression signs do not disappear; they become internalized. They continue to exist on a mental plane as mental expression signs. This idea is also the major innovation that the internalization model contributes to the theory of emotional development.

Correspondingly, Section 4.4.1 describes the ontogenetic onset of this expression internalization from the ages of 6 to 10 years and presents some of our own studies on its course. The phenomenon of expression internalization in adults is addressed in Section 4.5. Section 4.4.2 sketches the internalization of speech signs in order to emphasize the parallels between the internalization of speech signs in volitional action regulation and the internalization of expression signs in emotional action regulation. Section 4.4.3 presents a more detailed examination of the necessary conditions for an internalization of expression signs that children meet successively over the course of ontogenesis. These also include—according to the assumptions of the internalization model—the development of symbol
comprehension. This only becomes sufficiently mature to support internalization during the “5–7 year shift,” the transition to the “age of reason” (Sameroff & Haith, 1996; White, 1996). In the terminology of the internalization model and its levels of regulation, this addresses the level of reflective emotion regulation.

This chapter focuses exclusively on *intrapersonal* regulation. Naturally, the development of *interpersonal* regulation also continues, but we shall not address it here for reasons of space (see Feldman, 1982; Josephs, 1993; Lewis, 1993; Saarni, 1999; Saarni & Weber, 1999; Zivin, 1985). This includes the acquisition and application of further display rules regarding which emotions are to be shown in which social situations to whom with which expression. It also includes the use of expression signs to optimize the interaction with others directed toward serving one’s own motives (see Goffman, 1958, 1967).

### 4.4.1. The Internalization of Expression Signs

According to the internalization model, a so-called *internalization of expression signs* occurs round about the age of 6 onward. Under certain conditions, this can lead to the disappearance of the externally perceivable expressive reactions of an emotion, because the emotion system draws on representations of emotion-specific expression sensations stored in the central nervous system (see Section 3.1.2). This enables persons to feel expression sensations subjectively and interpret them as the subjective feeling of an emotion without these expression sensations needing to be objectively measurable at the same time.

Malatesta and Haviland (1985) talk about a “desomatization of affect” during ontogenesis in which overt display is displaced by internal representations. Magai and McFadden (1995) draw on the ontogenetic interiorization concept of Vygotsky (1934/1987), which we also refer to in our approach, when they write:

> Emotion socialization is seen as . . . learning to transfer overt expressive behavior into the internal world of elaborated representation (the interiorization process). (p. 142)

Certain conditions are necessary for an internalization of expression signs to occur (see also Sections 3.1.4 and 3.3.2):

The first condition is for expression signs to serve communication with the self and not with others. This is met in the intrapersonal regulation that emerges as a distinct entity alongside interpersonal regulation by the age of 6, as two studies have shown (Holodynski, 1997, Study V; Holodynski & Upmann, 2003b). Whereas 4-year-olds still displayed the action impulse of seeking a trusted person when in emotionally charged solitary situations, by the age of 5 years, they were able to

*We also assume that the body component of emotions becomes internalized when the above-mentioned conditions are met. However, we shall not pursue this topic here, because we have not yet done any empirical work on this topic.*
perform their own motive-serving actions. When doing this, they displayed overt expression signs. However, these now served exclusively to communicate with the self. The expression feedback signals the actual person–environment relation to children in motive-relevant ways, and leads them to act in line with their motives.

The second condition is for expression signs to serve an exclusively sign function in the regulation process. For mimic and vocal expression reactions, it seems clear that their semiotic function is nonverbal communication (see Ellgring, 1987). Accordingly, expressive reactions should be internalizable. However, Ekman (1988), for example, claims that the expression of surprise in the form of raised eyebrows plus wide-open eyes and mouth possesses the instrumental function of opening the sensory channels for information input. In this case, internalization would be dysfunctional. Nonetheless, Ekman’s claim has yet to be confirmed sufficiently in empirical studies (see Bruckschen, 2002; Camras, 2000; Reisenzein, 2000; Reisenzein, Bördgen, Holtbernd, & Matz, 2005). The expression reactions accordingly have to be internalizable.

For physical expression signs in the form of elementary emotion-specific actions such as approach during affection or flight during fear, the instrumental function seems plausible. This also holds for laughing when their function is to disperse a build up in tension (Sroufe, 1996) and, in limits, also for crying (see Vingerhoets, Cornelius, Van Heck, & Becht, 2000). Nonetheless, here as well, the semiotic function can be more important. We assume that the instrumental function is particularly salient when an emotion is so overwhelming that the individual possesses no differentiated actions to deal with it, for example, when panicking or feeling ecstatically happy.

The change in form from externally perceivable to mental expression signs can be operationalized and examined empirically from two perspectives.

The miniaturization hypothesis. The change in form refers to the observable intensity of expression. It should weaken as children grow older. This should occur in situations in which emotions possess an intrapersonal regulation function, in other words, when individuals perform the motive-serving actions by themselves, for example, when they are alone. The intensity of expression can become so miniaturized that no expression remains visible, although the individual concerned credibly insists on feeling an emotion.

The internalization hypothesis. The change in form can refer to the relation between expression and feeling. The internalization model claims that expression does not simply disappear but becomes internalized. In their subjective feeling, individuals continue to have expression sensations although, in the extreme case, they are no longer based on any objectively observable expressions. This aspect is far more difficult to assess and confirm empirically. Because we have studied this only in adults, we shall discuss internalization versus the mere miniaturization of expression in Section 4.5.1.

Studies on the miniaturization hypothesis. Testing the hypothesis on the intensity aspect of the internalization hypothesis calls for a special research design:
Children have to experience emotions in a situation in which intrapersonal regulation is dominant, which is generally the case when they are alone. The miniaturization hypothesis states that between the approximate ages of 6 and 10, expression intensity will weaken as a function of age.

There are two ways to rule out the possibility that the decline in the intensity of expression is due to a decrease in the intensity of emotion: First, one can ask children to report the intensity of the feeling they are experiencing. However, in this age range, they still find it hard to perform a valid intensity rating on an interval scale.

Therefore, a second option is to introduce a control condition. This presents the same cause of an emotion in an interpersonal condition in which a familiar person is available to whom participants can communicate and display their emotion. In such a condition, interpersonal regulation should be dominant. Familiarity is an important variable here, because studies on adults have shown that expression is weaker in the presence of a stranger (Hess, Banse, & Kappas, 1995; Wagner & Smith, 1991). Because the cause of the emotion remains the same, its intensity should be equally strong in both the solitary and interpersonal conditions. As a result, the internalization model states that children should continue to exhibit comparable expression intensity up to the age of 6 years, because they still require the real body feedback from their expression reactions to feel the induced emotion. Between the ages of 6 and 10, expression should weaken in the solitary condition compared with the interpersonal condition, which can be interpreted as an increasing miniaturization of expression. In this case, the decreasing intensity of expression in the solitary condition cannot be explained through a decrease in the intensity of the emotion.

Because such a research design has not yet been implemented in empirical research, we carried out a series of our own studies that are reported below.

Experiment 1: Cross-sectional study of adults and children. This study (Holodynski, 1995) was designed to test whether a miniaturization effect in solitary situations could be observed in adults but would prove to have not yet emerged in young children. Participants were 18 girls and 18 boys aged 3.6–6.9 years ($M = 5.19$, $SD = 0.85$) and 18 male and 18 female college students. They worked on tasks in which they could experience success and failure and correspondingly feel joy or disappointment in both a solitary and an interpersonal condition. The children had to stack towers of increasing height with wooden blocks. In the interpersonal condition, they did this in the presence of a familiar experimenter. The college students had to compose six different figures of increasing complexity from a tangram puzzle. In the interpersonal condition, they did this together with a friend. Hence, both interpersonal conditions were designed to enable participants to express their feelings to their interaction partners spontaneously. Among the college students, the intensity of their feelings was assessed at the end of the trial. They watched video recordings of their performance and were asked to recall and rate what they had felt after each success or failure. In the success condition, participants reported equally strong feeling intensities for both the solitary ($M = 5.2$)
and communication (M = 5.1) conditions. The same applied for failure (M = 4.1 and M = 4.4 respectively).

The success and failure episodes of children and college students were videographed so that face and upper body were visible. Both child and adult recordings were cut and spliced in random sequence to produce one rating videotape. Five naïve judges watched these episodes with sound and rated expression intensity on a 10-point scale and expression duration in seconds. Interrater reliability (Cronbach’s alpha) was .88 for expression intensity and .76 for expression duration in the success episodes versus .83 and .75 respectively in the failure episodes.

Results confirm the ontogenetic miniaturization effect (see Figures 4.5 and 4.6): The expression of adults in the solitary condition was markedly weaker and also markedly shorter than that of the 4- to 6-year-olds. This held for both the success and the failure episodes. Adult expression in the solitary condition was also weaker than in the corresponding interpersonal condition. An analysis of covariance with felt intensity as covariate revealed that the adults’ lower expression intensity in the solitary condition was not determined by a lower intensity of feeling. Feeling had been comparably intensive in both conditions.

In contrast, the children showed a similar expression intensity in the success episodes but a shorter expression duration in the solitary condition compared with
the interpersonal condition. This inverted in the failure episodes. However, the
difference between solitary and interpersonal condition was far less pronounced
than in adults. This indicates that the children’s expression is not, or not so strongly,
miniaturized.

This led us to ask at what age expression begins to miniaturize. Chapman
(1973) examined a study in 140 8-year-olds in which he systematically varied the
social context. The children wore headphones and listened to comic stories that
were designed to induce amusement under four conditions, with increasing social
reference ranging from listening alone to listening together with another child. The
duration of laughing and smiling revealed a linear increase from the first to the
fourth condition. Hence, the 8-year-olds already exhibit a clear miniaturization of
expression in a solitary compared with an interpersonal condition.

**Experiment 2: Cross-sectional study of 6- to 8-year-olds.** We carried out a
further cross-sectional study to test whether a marked miniaturization of expression

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FIGURE 4.6. Prototypical expression of a feeling of joy in a 4-year-old girl and an adult under solitary
versus social conditions.
emerges in the age range from 6 to 8 years (Holodynski, 2004). Three groups of 20 children (aged, 6, 7, and 8 years) fed two coins into a slot machine in order to purchase boxes of candy. The first box contained candy, and should have triggered weak joy. The second contained nothing although the wrapper suggested that it should contain candy. This should have triggered disappointment. To console them, the experimenter handed over a third coin to put in the slot machine. The third box with a plain wrapper once again contained candy, which should have induced strong joy after the disappointment over the empty box. In the interpersonal condition, an experimenter with whom the child was familiar was once again available to talk to.

After the emotion induction, each child had to rate intensity of feeling on a bipolar 7-point scale ranging from very disappointed (−3) over neutral (0) to very happy (+3). For the empty packet, the children reported a negative feeling valence (M = −1.13, SD = 1.58); for the full packets, a positive one (M = 2.54, SD = 0.60).

The strong joy induction triggered a more intensive expression than the weak joy induction, confirming that cause, expression, and feeling covaried. The intensity of expression declined in both the solitary joy and solitary disappointment conditions from the ages of 6 to 8 years, but the intensity of feeling did not change (see Figure 4.7). Furthermore, expression intensity in the interpersonal condition remained constant across age groups. Whereas expression was comparable in
both experimental conditions in the 6-year-olds, in the 8-year-olds, it was already markedly weaker in the solitary compared with the interpersonal condition. These findings clearly confirmed the miniaturization of expression with increasing age posited in the internalization model.

**Experiment 3: Longitudinal study of joy and disappointment from the ages of 6 to 10 years.** A longitudinal study with a comparable research design was carried out to test how far the increasing miniaturization of expression could also be found in intraindividual development (Hirte, 2003; Holodynski & Upmann, 2003a). We studied children on four occasions when they were 6, 7, 8, and 10 years old. Here as well, they worked the slot machine three times each under both a solitary and an interpersonal condition. However, the emotion inductions were modified slightly to improve control over sequence effects. To trigger weak joy, a single candy was placed in the box; to trigger strong joy, two candies so that the box was completely full. For disappointment, the box remained empty or it contained an empty candy wrapper. The sequence of experimental conditions and the emotion inductions were varied systematically. After the emotion episodes, the children had to rate the intensity of their feeling on a bipolar 7-point scale.

The videographed emotion episodes were cut and split in random sequence, and two judges assessed expression intensity from both pictures and sound. The interrater reliability (Cronbach’s alpha) was .91 for overall intensity of expression. The longitudinal study produced the following findings (see Table 4.4):

1. The strong joy induction triggered not only a more intensive feeling, $F(1, 24) = 113.47$, $p < .001$, $\eta^2 = .825$, but also a more intensive expression, $F(1, 19) = 49.03$, $p < .001$, $\eta^2 = .721$.
2. Six-year-olds exhibited an intensity of expression in the solitary condition comparable with that in the interpersonal condition for both strong joy and disappointment, but not for weak joy.
3. Expression intensity revealed a linear decline in solitary situations from the ages of 6 to 10 years for strong joy, $F(1, 24) = 10.33$, $p < .004$, $\eta^2 = .301$, and for disappointment, $F(1, 24) = 24.98$, $p < .001$, $\eta^2 = .473$. Weak joy revealed a quadratic trend: Expression intensity declined in the solitary situation from the ages of 6 to 8 years but then rose again at age 10, $F(1, 24) = 10.24$, $p < .004$, $\eta^2 = .299$.
4. At the age of 8–10 years, expression intensity was already significantly weaker in the solitary situation than in the interpersonal situation for all three emotions.
5. Furthermore, it was interesting to note that girls exhibited a greater intensity of expression than boys but the same intensity of feeling.

Results confirm the miniaturization hypothesis from the internalization model for intraindividual development as well, as far as the strong joy and the disappointment inductions are concerned. However, expression intensity does not seem to
TABLE 4.4. Intensity of Expression as a Function of Emotion Quality, Age, and Context

<table>
<thead>
<tr>
<th></th>
<th>Solitary</th>
<th></th>
<th>Interpersonal</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age groups</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>t</td>
</tr>
<tr>
<td>Strong joy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>2.51</td>
<td>1.19</td>
<td>2.41</td>
<td>1.22</td>
<td>0.39</td>
</tr>
<tr>
<td>7 years</td>
<td>2.15</td>
<td>1.15</td>
<td>2.41</td>
<td>0.99</td>
<td>−0.80</td>
</tr>
<tr>
<td>8 years</td>
<td>1.72</td>
<td>1.13</td>
<td>2.97</td>
<td>0.63</td>
<td>−4.64**</td>
</tr>
<tr>
<td>10 years</td>
<td>1.65</td>
<td>1.01</td>
<td>2.78</td>
<td>0.86</td>
<td>−4.21**</td>
</tr>
<tr>
<td>Weak joy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>1.47</td>
<td>1.16</td>
<td>1.98</td>
<td>1.25</td>
<td>−2.30*</td>
</tr>
<tr>
<td>7 years</td>
<td>1.04</td>
<td>0.97</td>
<td>1.62</td>
<td>1.27</td>
<td>−2.20*</td>
</tr>
<tr>
<td>8 years</td>
<td>0.83</td>
<td>1.21</td>
<td>1.93</td>
<td>0.91</td>
<td>−4.22**</td>
</tr>
<tr>
<td>10 years</td>
<td>1.38</td>
<td>0.87</td>
<td>2.29</td>
<td>0.74</td>
<td>−3.90**</td>
</tr>
<tr>
<td>Disappointment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years</td>
<td>2.87</td>
<td>1.50</td>
<td>2.83</td>
<td>1.09</td>
<td>0.18</td>
</tr>
<tr>
<td>7 years</td>
<td>2.40</td>
<td>1.47</td>
<td>2.12</td>
<td>0.89</td>
<td>0.89</td>
</tr>
<tr>
<td>8 years</td>
<td>1.65</td>
<td>0.90</td>
<td>2.81</td>
<td>1.05</td>
<td>−4.63**</td>
</tr>
<tr>
<td>10 years</td>
<td>1.63</td>
<td>1.09</td>
<td>2.47</td>
<td>0.65</td>
<td>−3.52**</td>
</tr>
</tbody>
</table>

Expression scale ranging from 0 to 5 (very strong expression). *p < .05. **p < .01.

decline any further from ages 8 to 10 years but to remain on a miniaturized level. The expression is not (yet?) invisible. Similar results have also been found in studies of adults by Fridlund (1991) and Hess et al. (1995). In the weak joy induction, expression seems to be miniaturized already in 6-year-olds. These declines in expression cannot be attributed to a decline in the intensity of feeling. They can be interpreted as a product of an increasing miniaturization of expression.

The assumption that expression signs become miniaturized during the course of development is not just restricted to joy or disappointment. In principle, it applies to all emotions, given the conditions that they exclusively serve an *intrapersonal* and semiotic regulation function (see Section 3.1.4) and that the child has acquired a sufficiently advanced comprehension of symbols (see Section 4.4.3).

Soussignan and Schaal (1996) performed a cross-sectional study on the expression of disgust and delight triggered by “hedonically contrasted” odors in an alone and a social presence condition (in which, however, an *unfamiliar* experimenter was present). According to the display rule approach, this should lead to an inhibition of the negative emotional expression. Participants were 50 children aged 5–12 years. Unpleasant smells revealed no decrease in expression intensity (disgust) in the alone condition. For pleasant smells, the intensity of expression (delight) was already lower in the alone condition compared with the social presence
condition for the youngest age group, and it did not decrease as a function of increasing age.

These findings initially seem to argue against any increasing miniaturization of expression for disgust and delight, and favor a context effect according to which disgust is displayed in solitary conditions but not in social ones (with unfamiliar persons). However, one can also interpret these findings as indicating that a miniaturization effect has already emerged at preschool age for the expression of delight. The children already showed less expression in the solitary condition. In contrast, the miniaturization effect might emerge only later for disgust. This interpretation is also supported by findings on adults revealing a clear miniaturization effect for pleasant and unpleasant smells in a solitary compared with an interpersonal condition (Jäncke & Kaufmann, 1994; Rolko, 2001).

4.4.2. THE INTERNALIZATION OF SPEECH SIGNS

We have already mentioned that children require some time to develop the ability to regulate their actions through the meaningful content of speech. Most of the verbally conveyed action regulation in early years occurs within the interaction between the child and others. Nonetheless, by approximately the age of 5 years, children have learned to use speech signs for self-instruction as well and to use them to talk to themselves. This self-instructing speech has also been called private speech (see Diaz & Berk, 1992). Vygotsky (1934/1987) was the first to recognize its importance in volitional self-regulation. This development proceeds analogue to the internalization of expression signs in emotional action regulation.

Here as well, intrapersonal regulation also initially emerges within interpersonal regulation. Children still require the social framework and the idea of mastering a task in interaction with others—even though they actually use speech as self-instruction and already master tasks without the help of others.

Increasing autonomy is also accompanied by a change in the form of speech signs. Audible private speech becomes a silent inner speech that expresses itself at most in slight lip movements. However, in their subjective perception, children are speaking to themselves in their minds. The premise that speech signs become internalized has been proposed many times and also confirmed empirically (see Diaz & Berk, 1992; Fuson, 1979).

4.4.3. THE DEVELOPMENT OF SYMBOL COMPREHENSION IN REFLECTIVE EMOTION REGULATION

When explaining our internalization model in Section 3.3.2, we proposed that the internalization of expression also depends on a further condition: the transformation of expressive reactions into signs that can also be used symbolically. In other words, children have to be able to distinguish consciously between an expression
sign and its object—the subjective feeling—and to apply the former independently from the latter.

This condition involves the development of symbol comprehension on the reflective level of emotion regulation. This level is composed, in the broadest sense, of symbolic representations of how one’s own and others’ minds function as well as procedural knowledge about how one can influence and regulate one’s own and others’ minds. Hence, these meaning systems cover the entire domain of knowledge about emotions including their causes, functions, forms of expression, regulation strategies, development, and so forth (see Janke, 1999, 2002).

When a sign is used symbolically, its function is not bound to a specific form. Any other form can serve the same display function for its user. For example, expression signs can be translated into speech signs. In the case of self-regulation, it is not necessary for signs to be perceivable for others; it is enough for them to be represented only in subjective sensation as distinguishable, meaning-carrying signs. This is how physical signs that are objectively perceivable become mental signs that are perceived only subjectively and no longer by others. A subjectively sensed smile does not have to be caused by body feedback on a real smiling reaction; a mental representation that generates a comparable smile sensation is a sufficient form for a sign in self-regulation.

However, how does a symbol comprehension develop for expression signs? We think the decisive developmental step is the transition from a behavioral to a mental understanding of emotion between the ages of 6 and 8 years (see Meerum Terwogt & Olthof, 1989; Selman, 1981).

Selman (1981) has analyzed the development of symbol comprehension in terms of expression signs and broken it down into five stages. The first three of these stages are relevant for our analyses. They are:

1. Expression signs are used exclusively as a symptom.
2. Expression signs can be used as an implicit symbol; that is, children are already able to use them as symbols for emotions in their actions, but they are still unable to reflect on this distinction in their minds.
3. Expression signs can be used as voluntarily applicable symbol; that is, children are able to distinguish consciously between expression and feeling and can conceive that a feeling is possible without an expression and an expression is possible without a feeling.

We assume that the development of the symbol comprehension of expression signs follows the same general trend as that observed in the symbol comprehension of speech signs (see Vygotsky, 1934/1987).

*Expression signs as a symptom.* In the first phase during infancy, children already use expression signs, but cannot separate them from their objects. Signs have an exclusively symptom character. If a cause-related expression sign is present,
then the corresponding emotion and the corresponding feeling will also be induced (see Section 4.2.1).

Expression signs as an implicitly used symbol. By the age of 12 months, children begin to single out certain expression signs from the stream of interpersonal regulation and assign them a symbol function. This is first seen in social referencing (see Klinnert et al., 1983; Walden, 1991): Children start to interpret their mother’s facial expression not as a symptom of their actual feeling but as a symbol that should represent a generalized action tendency. Mother’s smile stands for “approach”; an anxious face, for “avoidance.”

From the age of 1 and 2 years onward, further situations arise in which children use expression signs as symbols for an emotion. When totally involved in their symbolic play, they do not just act out single actions such as cooking or driving an automobile in a pretended manner. Children also act as if they were experiencing single emotions. They use the prototypical expression sign of an emotion as a symbol to display this emotion; for example, they act as if they were crying to symbolize sadness (see Dunn, Bretherton, & Munn, 1987; Gottman & Parker, 1986). Other action in which expression signs are used as a symbol for an emotion are teasing and deceiving others (see Bretherton, Zahn-Waxler, Fritz, & Ridgeway, 1986). In all these situations, children play with the expression as a symbol of an emotion that has a distinct appeal character and should generate a specific impression in others that will make them feel obliged to deliver an appropriate reaction.

Nonetheless, this ability to separate the sign from its object reveals one special feature that is characteristic for the second phase of symbol comprehension: When children are questioned during this phase of development, they are still unable to imagine somebody crying without being sad or smiling without being happy. They interpret the expression sign as an inseparable property of the object. Children do not distinguish consciously between expression and feeling, although their symbolic play, for example, already reveals that they use the expression sign as the symbol for a feeling, in other words, that they separate the two in their behavior.

Rottleuthner-Lutter (1987) has carried out an informative study on this. She asked 100 children in five age groups from 5 to 9 years whether it would be possible to be happy without anybody noticing. She repeated this question for the feelings “sad” and “afraid.” The responses and accompanying justifications given by the younger children up to 6.6 years basically fall into two categories.

First, the children say that it is not possible, because you can see when somebody is sad in that they cry (or smile when happy). They consider expression to be a necessary property of a feeling. If the expression changes, the feeling changes as well.

Alternatively, the children say that it is possible, because nobody will notice when somebody is sad, fearful, or happy if they are alone or have hidden themselves. Therefore, there has to be a spatial separation to prevent an observer from seeing the person concerned. Rottleuthner-Lutter (1987) calls this response
pattern “local-sensory.” Of the twenty 5-year-olds, 18 (90%) replied consistently with this response pattern (2 children continued to use the first response category reported above). Fourteen (70%) of the twenty 6-year-olds but none of the twenty 9-year-olds continued to use this second response pattern.

This particular feature of symbol comprehension seems to be a general characteristic of this phase of development. Vygotsky (1934/1987) has reported that children have comparable difficulties in distinguishing between the names of things and their properties. When asked whether one can replace the name of a thing with another name, they say that this is not possible. The proposal that a dog can also be called a “cow” and a cow can also be called a “dog” is rejected because the dog does not have udders and horns. Likewise, the cow cannot be called a dog because cows do not bark but go “moo.” The property of the object is conceived as a property of the sign in speech signs as well.

This inability to discriminate conceptually corresponds with the objective lack of differentiation between the expression and feeling components of an emotion in children of this age. When experiencing emotions in this phase of development, children also display them in observable expression signs even when they do not want to impress another person and can already perform the action to deal with the situation by themselves (see Section 4.4.1; Holodynski, 1997, Study IV and Study V).

Expression signs as a voluntarily applicable symbol. Children generally grow up in a cultural environment that promotes the further development of the symbol comprehension of emotional processes (see below). The shift from the second to the third phase of development in the symbol comprehension of expression signs can be seen very clearly in the study by Rottleuthner-Lutter (1987) reported above. She found that local-sensory response patterns decreased clearly from the age of 7 years onward. They were replaced by an increase in the number of “dualistic” responses revealing that the children discriminated consciously between emotion expression and emotion feeling, for example, “you feel happy inside and nobody notices it.” Among the 5- and 6-year-olds, only 1 (5%) of 20 children showed a consistent dualistic response pattern; among the 7-year-olds, this was already 9 (45%) out of 20 children; and in the 9-year-olds, 14 (70%) out of 20.

Hence, the use of expression signs as a voluntarily applicable symbol emerges during the same age range of 6–8 years in which the miniaturization of expression can be observed in intrapersonal regulation (see Section 4.4.1). The ontogenetic internalization of expression signs accordingly corresponds to the conceptual differentiation between expression and feeling.

The cross-sectional study of 6-, 7-, and 8-year-olds already reported above (Holodynski, 2004) also examined emotional concept knowledge on the discrimination between expression and feeling. The degree to which children could distinguish conceptually between expression and feeling correlated with the degree of expression miniaturization in intrapersonal regulation. The more clearly the children could discriminate between expression and feeling in their minds, the weaker
TABLE 4.5. Correlations between the Conceptual Differentiation of Expression and Feeling and the Extent of Miniaturization of Expression as a Function of Age Group

<table>
<thead>
<tr>
<th>Miniaturization effect</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expression (solitary)</td>
<td>.56*</td>
<td>.60**</td>
<td>.37</td>
</tr>
<tr>
<td>Difference in expression</td>
<td>.43*</td>
<td>.45*</td>
<td>.21</td>
</tr>
<tr>
<td>N</td>
<td>20</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

*a*Intensity of expression in the solitary situation.  
*b*Difference in intensity of expression between interpersonal situation and solitary situation.  
*"*p < .05.  
**"*p < .01.

The ability to consciously discriminate the expression and feeling components on the reflective level of regulation covaries with the transition from externally perceivable expression signs to miniaturized and mental expression signs. This may be a first indication that the internalization of expression signs is not just bound to the emergence of intrapersonal regulation as an independent entity alongside interpersonal regulation. It is also bound to a mature symbol comprehension in which expression signs are recognized as voluntarily applicable symbols that can be distinguished from subjective feelings. This makes it possible to transfer the meaning of externally perceivable expression signs to expression signs that can now be perceived only internally.

Socialization of symbol comprehension. Two socialization processes encourage the development of symbol comprehension for expression signs:

1. Children are told that they should comply with cultural display rules for expression (see Cole, 1986; Josephs, 1993, 1999; Saarni, 1984, 1988, 1993; Saarni & von Salisch 1993): Parents and childrearers increasingly demand that children should display defined, conventionalized expression signs as a function of context, person, and cause, for example, to say thank you for a present with a friendly smile even when one is disappointed in it. Complying with display rules confronts children with the task of inhibiting the spontaneously triggered expression sign of the induced emotion and replacing it with the expression sign required by the display rule. This grants children the experience that expression and feeling can contradict each other and that the feeling still remains even when another expression is displayed.

2. Parents promote their children’s development by talking to them about emotions and playing with emotion expression in, for example, role-play or teasing. With the help of speech signs, children build up a second, more comprehensive sign system to supplement expression signs, and they use
this to learn to understand the meaning of the single components and relationships in the emotion system (see Bretherton et al., 1986; Dunn, 1994; Harris, 1992; Janke, 1999, 2002; Manstead, 1993; Meerum Terwogt & Olthof, 1989; Russell, 1989). Speech signs are the signs that constitute the volitional and reflective levels of regulation. Talking about emotions with parents draws children’s attention to the difference between expression and feeling, that is, to the difference between externally perceivable expression signs and the proprioceptive and interoceptive feeling indicators accompanying an emotion (Selman, 1981). Children start to acquire that which they already practice in their behavior on the reflective regulation level as well: The expression sign can be separated from the feeling. It can be applied voluntarily as a symbol in order to give the impression that one is feeling an emotion.

4.5. MENTAL EMOTIONS AND ADULT EMOTION REGULATION

Up to now, there are very few theories and studies dealing explicitly with the development of emotional action regulation from early to late adulthood (see Carstensen, 1993; Fischer, 1988; Magai & McFadden, 1996). These studies have examined how the frequency, intensity, and expression of emotions as well as their reflective regulation change as a function of age. However, they have not considered how far any internalization of expression signs can be observed in adults, and, hence, whether the so-called “as-if” feelings actually exist—in the extreme case, as purely mental emotions without any discernable expression and body reactions.

Hence, the first aspect of this section will be to pursue this issue and present our own and other researchers’ studies that can be used to test the hypotheses of the internalization model for adults. The second aspect will be to look at how reflective emotion regulation develops further in adulthood. For example, Carstensen (1993) and her team have formulated a theory of socioemotional selectivity according to which emotion regulation is continuously optimized with increasing age.

4.5.1. SUPPORT FOR MINIATURIZED AND INTERNALIZED EXPRESSION SIGNS

Because of the small number of developmental studies on adults, it might seem tempting to draw on emotion research in general psychology as it deals explicitly with adult emotions. However, it does not adopt a process-oriented perspective on how adult emotions differ from those of children and on how they may continue to develop in adulthood. Emotion research in general psychology analyzes emotions essentially from a structure-oriented perspective on how emotions as mental
systems function in the actual genesis, and assume that its system structure is no longer subject to change.

The internalization model to the extent that it has been formulated so far also does not assume any further fundamental change in the system structure of emotions in adulthood. However, it does assume that those trends already considered in Section 4.4 continue. This means particularly the internalization of expression signs and the accompanying formation of a mental level of emotion regulation as well. We assume that a major proportion of the low- to medium-intensity emotions in intrapersonal regulation take place as “as-if” feelings; that is, they are accompanied by weakened objectively observable expression and body reactions. This is because with advanced symbol comprehension—according to the internalization hypothesis—miniaturized or even completely mental expression signs suffice for an efficient emotional regulation of one’s actions. Mental feeling sensations suffice for the selection of coping actions to serve one’s motives. It becomes unnecessary to stage the emotion in intensive expression and body reactions—unless this is something that one wants to do. Relatively intense expression and body reactions should continue to be observable only for intensive emotions, indicating a completely unexpected motive-relevant event for which no rehearsed coping actions are available. However, we also assume that there are major interindividual differences in the extent of expression miniaturization and internalization.

In the following, we shall report further evidence from studies on adults supporting the miniaturization hypothesis of the internalization model, that is, a decrease in expression intensity during intrapersonal regulation. We shall refer not only to studies on emotion in general psychology but also our own work.

In addition, we have also carried out studies with adults to test the previously unexamined internalization hypothesis of the model—whether an internalization of expression signs occurs with the consequence that a person continues to sense clear expression and body sensations subjectively, which serve as a somatic marker for an emotion, although external observers can see no or only very slight expression and body reactions.

*Studies on the miniaturization hypothesis.* The miniaturization hypothesis states that the intensity of emotional expression in adults will be weaker in situations in which regulation is intrapersonal compared with situations in which feelings are shared with an interaction partner. Generally, being alone is considered to be the prototypical situation for intrapersonal regulation.

A series of studies has shown that the intensity of expression is weaker when social involvement is low (Brightman, Segal, Werther, & Steiner, 1975, 1977; Kraut & Johnston, 1979). Fridlund (1991) asked participants to watch amusing film clips either alone or together with a friend. Although participants reported comparable intensities of feeling, expression was clearly weaker in the solitary
condition (see also Dale, Hudak, & Wasikowski, 1991). However, when formulating his ecobehavioral theory, Fridlund (1994) favored the extreme position that expression does not covary with emotional intensity but depends exclusively on this degree of social involvement.

Hess et al. (1995) along with Jakobs, Manstead, and Fischer (1999) tested this claim by replicating Fridlund’s research design (Fridlund, 1991) but additionally varying the intensity of the cause of the emotion. They showed college students two film clips that differed in how amusing they were. They managed to replicate the miniaturization effect, showing that expression in the solitary situation was weaker than in the social situation despite the same intensity of feeling. In addition, when watching the more amusing film clip, participants were not only more amused but also displayed a stronger expression. In other words, expression and feeling covaried in direct contradiction to Fridlund’s ecobehavioral explanation of expression miniaturization. Our studies also produced comparable results for adults (Holodynski, 1995) and 8- to 10-year-olds (Hirte, 2003; Holodynski, 2004).

Moreover, the studies of Fridlund (1991), Hess et al. (1995), and Jakobs et al. (1999) clearly demonstrate the social origins of expression reactions in solitary situations. All three studies introduced further research conditions varying the degree of social involvement: (1) Participants viewed the film alone; (2) alone, but a friend was present in the next room working on a different task; (3) alone, but a friend was present in the next room watching the same film; (4) with a friend together in the same room. Results showed that expression intensity increased as a function of the degree of social involvement from Conditions 1 to 4, although all participants watched the same film clips and reported comparable intensities of feeling (see also Chovil, 1991).

These experiments show clearly that persons also do not completely abandon or lose the social reference of actions when engaged in intrapersonal regulation in a solitary situation. Even if other persons are not really present one does not completely stop acting as if others were present. An imaginary social context can then, in turn, reduce the degree of expression miniaturization, as the two experiments above have shown.

Fridlund (1994, pp. 160–168) proposed five possible ways in which individuals may act as if they were in an imaginary social context even when they are physically alone:

1. They may treat themselves in the same way that they treat others.
2. In solitary situations, they may act as if others were also present.
3. They may imagine that others are present.
4. They may prepare themselves for the possibility of being joined by others (see Goffman, 1958, 1967).
5. They may attribute life or consciousness to an inanimate object and thus turn a nonsocial situation into a social one (e.g., shouting at our word-processing program when it doesn’t do what we want it to do).

One criticism of the experimental studies reported above is that they address only a single emotion, namely, amusement. It has to be asked whether such a miniaturization of expression can also be observed in other emotions. We were able to show this for the emotion joy (not amusement) and disappointment in the study of adults reported in Section 4.4 (Holodynski, 1995). In a study in which participants watched sadness-inducing film clips, Jakobs, Manstead, and Fischer (2001), in contrast, found that they displayed more intensive negative expression signs in solitary situations than when they watched the film clips together with a friend. Evidently, negative expression signs may be masked in social situations.

Another criticism is that all studies—including those just reported above—were carried out in the artificial context of a psychological laboratory. The laboratory atmosphere might intimidate participants so much that they suppress their expression when alone, and feel confident about showing their feelings again only when reassured by the presence of familiar persons.

Hence, we tested whether the miniaturization of expression is not just a laboratory effect but will also occur in everyday situations when adults are alone and generalize to a variety of emotions. We carried out a diary study with 38 women and 42 men aged 20–44 years (M = 25.76, SD = 4.00) (Wüllner, 1997). They used a standardized diary to protocol every feeling they had in terms of the intensity and duration of the feeling, the intensity and duration of expression, situational context (alone, interpersonal, alone in the company of strangers), and expression control (authentic vs. nonauthentic expression). They completed this diary from getting up until going to bed for 4 days within a single week. It should be noted that the participants in this study rated their emotional expression by themselves.

However, this seems acceptable, because Barr and Kleck (1995) showed that such self-ratings and other ratings of the videographed expression correlate sufficiently. Their participants watched humorous film clips under a solitary (Experiment 1) and an interpersonal condition (Experiment 2). They had to self-rate the intensity of their facial expressions on an 11-point scale. At the same time, their facial expression was videotaped and its intensity was assessed by external raters. Mean expression intensity had a self- versus other-rating correlation of \( r = .55 \) in Experiment 1 and \( r = .59 \) in Experiment 2. However, mean expression intensity was rated as being more intensive in the self-rating (Experiment 1: M = 4.73) than in the other rating (M = 3.58) when participants were alone. In the interpersonal situation (Experiment 2), self-rating (M = 4.29) did not differ from other rating (M = 4.12). Our own research has confirmed this as well (Holodynski, 1997, Study III): Self-rating had a correlation with the mean other rating of \( r = .56 \)
and had higher expression intensities. Such an intensity bias in self-ratings may well distort findings and cover up any miniaturization of expression. However, should expression nonetheless continue to be rated as being weaker in solitary situations than in interpersonal situations, this would be a robust support for the assumed miniaturization of expression.

This is exactly what we found: Comparing situations in which participants reported that they had not controlled their expression (i.e., authentic expression), expression was rated as being weaker in solitary situations (M = 3.5, SD = 2.3) than in interpersonal situations (M = 4.8, SD = 2.0), even when controlling for intensity of feeling as covariate. Ten naïve raters ranked reports on feeling quality to the 16 categories of the EMO16 Emotion Scale (Schmidt-Atzert & Hüppe, 1996). An analysis based on these categories revealed a miniaturization effect for joy, anger, sadness, affection, surprise, pride, and restlessness, but not for fear and aversion/disgust (see Table 4.6). The emotions boredom, sympathy, shame/embarrassment, guilt, sexual arousal, longing, and envy were not observed frequently enough to permit any meaningful analysis.

In all, the studies reported here support the miniaturization hypothesis predicted by the internalization model. Expression becomes weaker in situations in which emotions possess an intrapersonal regulation function, which is predominantly the case when persons are alone.

Studies on the internalization hypothesis. The internalization hypothesis states that expression signs do not disappear, but become internalized. In other words, individuals can continue to experience their expression sensations in their

### TABLE 4.6. Expression Intensity in Everyday Emotion Episodes without Expression Control as a Function of Emotion Quality and Context

<table>
<thead>
<tr>
<th>Context</th>
<th>Solitary</th>
<th>Interpersonal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M  SD n^b</td>
<td>M  SD n^b</td>
</tr>
<tr>
<td>Affection</td>
<td>2.88 2.21 26</td>
<td>5.36 1.82 192</td>
</tr>
<tr>
<td>Pride</td>
<td>3.00 2.35 21</td>
<td>4.04 2.01 26</td>
</tr>
<tr>
<td>Joy</td>
<td>3.64 2.12 310</td>
<td>4.71 1.90 774</td>
</tr>
<tr>
<td>Sadness</td>
<td>3.73 2.36 118</td>
<td>5.03 1.93 78</td>
</tr>
<tr>
<td>Anger</td>
<td>3.51 2.29 152</td>
<td>4.81 1.98 129</td>
</tr>
<tr>
<td>Restlessness</td>
<td>3.63 2.23 137</td>
<td>4.66 1.87 71</td>
</tr>
<tr>
<td>Disgust/aversion</td>
<td>4.44 2.92 9</td>
<td>5.54 2.26 13</td>
</tr>
<tr>
<td>Surprise</td>
<td>4.26 2.92 23</td>
<td>5.13 1.86 68</td>
</tr>
<tr>
<td>Fear</td>
<td>4.00 2.47 66</td>
<td>4.73 2.12 30</td>
</tr>
</tbody>
</table>

^aExpression scale from 0 to 9 (extremely strong). Each test controls for the intensity of feeling as covariate.
^bNumber of emotion episodes.
^cEffect sizes. †p <.10.  *p < .05.  **p < .01.  ***p < .001.
subjective feelings even though external observers can no longer detect any expressive reactions at all.

Accordingly, the qualitative change in the form of expression signs is that objectively observable expression signs can become miniaturized and, finally, purely mental expression signs. These continue to exist only as mental representations of specific expression signs. An observable frown becomes an internal sensation of frowning. Nonetheless, this inner frown can still be traced as micromomentary movements with the help of electromyographic (EMG) recordings.

In the extreme case, these expression signs can become so miniaturized that they exist only as mental representations and can no longer be traced in EMG recordings or other objective measures. In that case, they are, strictly speaking, not expression signs any more, but feelings that can be assessed only through self-report. On the other hand, in subjective feelings, they continue to possess—according to the internalization hypothesis—a similarity to their original, objectively observable forms. This justifies calling them expression signs with the qualification that they are directed exclusively toward the individual himself or herself. This is why we call them mental expression signs.

Hence, the internalization hypothesis states that the proprioceptive and interoceptive feedback on expression and body reactions serves as a subjective indicator, and it remains such even when no expression reactions are observable objectively.*

Cacioppo, Bush, and Tassinary (1992) were able to show that even with such miniaturized expression signs that can no longer be perceived by external observers, the valence and the intensity of the feeling covaried with the valence and the intensity of the micromomentary facial movements measured with EMG (see also Tassinary & Cacioppo, 1992). Nonetheless, this finding does not tell us whether they are used as feeling indicators in subjective experience.

Two conditions have to be met when testing the internalization hypothesis: First, one has to induce an emotion under those circumstances in which a miniaturization of expression can be observed, in other words, in which no (or only very weak) expression reactions occur. Second, one has to ask participants how far they have experienced a feeling and which indicators they have used to reach this feeling judgment.

We used two empirical studies to examine this in our laboratory. In the first study, we used a stimulus recall technique (von Olberg, 1999) to induce the emotion joy at reunion and—after a 1-week interval—pride in 16 men and 15 women in a relaxed state. This sequence of inductions was reversed for one half of the

*It is plausible for an internalization to also occur for body reactions when the necessary preconditions are met, namely, exclusively intrapsychological and semiotic regulation functions along with a mature comprehension of symbols for body signs. However, it should be noted that the instrumental regulation function will be more pronounced in body reactions than in expression reactions.
participants. The second study induced only joy at reunion in 13 men and 13 women (Upmann, 2000; see also Holodynski, von Olberg, & Upmann, 2001).

We started off by (1) asking participants to recall an intensive episode of joy at reunion and an intensive episode of pride in which they had displayed the authentic expression on both occasions. (2) From each of these episodes, we asked them to name two key stimuli: one characterizing the situation and the other characterizing the cause of the emotion. (3) An imaginary journey was used to induce a progressive muscle relaxation. Taking participants on such imaginary journeys not only activates mental images but also lowers participants’ muscle tone and, hence, their expression reactions as well (see Bower, 1981; Schmidt-Atzert, 1996; Schultz, 1979; Vrana, 1993). (4) Then—unexpectedly for the participants—the emotional key stimuli were spoken out loud to reactivate the emotion. (5) After 15 s, participants were distracted from this induced emotion episode by an unexpected question (“Which is the fourth letter in the alphabet?”). (6) This was followed by a detailed interview on what the participants had felt, if they had felt the emotion episode once again and not just recalled it, and which feeling signs they used to conclude this. This procedure produced a time window in which the videotaped expression behavior of the participants could be compared with their reports on the feeling signs they had experienced at the same time.

The videotaped expression scenes in which the participants felt pride or joy at reunion were spliced together in random sequence with scenes in which they were in a relaxed state when expression should be broadly neutral. This rating tape was given to 10 naïve judges who assessed emotion quality and expression intensity. The chance of correctly rating emotion quality was 33% for each choice (joy, pride, or neutral). If correct ratings of emotion quality were no higher than chance and expression intensity were close to zero, it could be assumed that participants had not shown any emotion-discriminating expression reactions. Both studies revealed the existence of mental expression signs. In Upmann’s study, 20 (77%) of the 26 participants reported that they had reexperienced the joy at reunion relatively intensively (Upmann, 2000; see Table 4.7).

None of them produced audible verbal or vocal utterances during the relaxation and emotion episodes. The 10 naïve judges also rated all joy episodes as relaxation episodes on the basis of body posture and gestural expression. However, the performance of 9 (45%) out of 20 participants was above chance when rating joy episodes on the basis of facial expression—these participants had smiled. In contrast, 11 participants felt joy at reunion without this being identifiable to outsiders in their expression. Participants without expression also reported having felt potentially observable expression signs (such as smiling, turning to the other person, inner speech in the form of utterances of greeting or joy) and not just body signs (see Table 4.7).

In the study of von Olberg (1999), 24 out of the 31 participants reported having clearly reexperienced both feelings of joy at reunion and pride. Observers
TABLE 4.7. Intersubjectively Observable Expression Quality and Intersubjectively Experienced Expression and Body Signs when Reactualizing Joy at Reunion

<table>
<thead>
<tr>
<th>Perceived feeling during joy induction (Self-rating)</th>
<th>Joy at reunion (n = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deduced feeling (other ratings by 10 observers)</td>
<td>Joy (n = 9) Neutral (n = 11)</td>
</tr>
<tr>
<td>Intensity of feeling (self-rating)</td>
<td>M = 7.00 M = 6.27</td>
</tr>
<tr>
<td>Intensity of expression (other ratings by 10 observers)</td>
<td>M = 2.03 M = 0.16</td>
</tr>
</tbody>
</table>

Subjectively felt expression signs
- Smiling 89% 54%
- Vocal sound or verbal utterance of joy 56% 54%
- Action impulse of turning toward other person 89% 64%

Subjectively felt body signs
- Potentially visible body sign (shallow, deep breathing, moist eyes, swallowing) 44% 18%
- Warmth 56% 36%
- Arousal 33% 27%
- Tension 33% 27%
- Relaxation 44% 9%

---

*a Scale of intensity of expression and feeling from 0 to 9 (extremely strong).
*b Twenty out of 26 participants reported feelings of joy.
*c At least 7 out of 10 observers classified feeling accordingly on the basis of facial expression.

correctly identified joy episodes at above chance in only 9 of the 24 participants. Observers seemed to identify joy episodes on the basis of a slight smile. Pride episodes were identified correctly in only 1 of the 24 participants; for three participants, their pride episode was classified incorrectly as joy. The other participants who experienced feelings reported subjectively sensed expression movements and speech signs, even though the observers were unable to ascertain any identifiable emotion expression (see Table 4.8). Hence, individuals no longer just draw on proprioceptive perceptions of real expression processes as feeling signs but also possess mental representations of such expression signs that are brought to mind when feeling an emotion. Damasio’s “as-if feelings” seem to exist not only for body sensations but also for expression signs (Damasio, 1994).

Moreover, the analysis on the level of single feeling signs showed that it is particularly mental expression signs that contribute to the differentiation of emotions. Mental expression signs and sensed action impulses seem to make a far greater contribution to differentiating between emotions of equal valence, in this case, joy at reunion versus pride, than do body sensations. As Figure 4.8 shows, inner smiles occurred during both pride and joy at reunion. On the one hand, this may mean that smiling is only valence-specific but not emotion-specific. However, it may also mean that the participants felt both pride and joy. In this case, smiling could also be emotion-specific.
TABLE 4.8. Intersubjectively Observable Facial Expression and Intersubjectively Experienced Feeling during the Reactualization of a Joy and Pride Episode

<table>
<thead>
<tr>
<th>Perceived feeling (Self-rating)</th>
<th>Joy at reunion ($n = 24$)</th>
<th>Pride over a success ($n = 24$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deduced feeling (Other rating by 10 observers)$^b$</td>
<td>Joy ($n = 9$)</td>
<td>Neutral ($n = 15$)</td>
</tr>
<tr>
<td>Intensity of expression (other rating)</td>
<td>$M = 2.1$</td>
<td>$M = 0.3$</td>
</tr>
<tr>
<td>Intensity of feeling (self-rating)</td>
<td>$M = 6.1$</td>
<td>$M = 5.9$</td>
</tr>
</tbody>
</table>

$^a$Scale of intensity of expression and feeling from 0 to 9 (extremely strong).
$^b$At least 7 out of 10 observers classified feeling accordingly on the basis of facial expression.

In all, the results indicate that mental expression signs and action impulses tend to signalize the emotion specificity, whereas body sensations, in contrast, seem to signalize whether any emotion has been brought to mind at all.

It seems as if the emotional feeling as a whole is retained in the form of an internally sensed configuration of expression signs, action readinesses, and body reactions even when no expression signs or actions can (still) be observed in external behavior. We view these findings as providing initial support for the hypothesis that expression signs do not disappear but become internalized, as predicted by the internalization model of emotional development.

4.5.2. THE DEVELOPMENT OF REFLECTIVE EMOTION REGULATION

Carstensen (1993) claims that a further optimization of reflective emotion regulation occurs during the course of adulthood. The aged seem to experience fewer negative emotions and more positive ones. Carstensen, Pasupathi, and Mayr (1998) report this finding from a study in which participants aged 18–94 years were asked to record the quality and intensity of their feelings for a complete week. As in Larson and Lampman-Petraitis’ study of juveniles (Larson & Lampman-Petraitis, 1989), an electronic pager was used at random to tell participants when to complete their protocols.

In addition, Carstensen, Gottman, and Levenson (1995) showed that when older persons engaged in a discussion on conflict-prone topics, they were better at regulating the negative emotions arising from the conflict topic than younger persons. The former showed less negative expression in general, also interspersed the interaction with positive expression signs, and expressed their liking for the interaction partner. They exhibited an effective regulation pattern that successfully dispersed the induced negative emotions. This capability is attributed to two developmental phenomena that emerge in late adulthood.
FIGURE 4.8. Percentage of participants with no joy ($n = 15$) and pride expression ($n = 20$) who had experienced the given expression and body signs during the reactualized joy and pride episodes. *$p < .05$.

**Shift in ranking social motives.** Carstensen and Frederickson (1998) assume that the priorities assigned to different motives change in the aged. The authors distinguish between two classes of social motive that follow different developmental trajectories: those in the knowledge trajectory (e.g., power, performance) and those in the emotion trajectory (e.g., affiliation). Although all motives involve emotions, social motives in the emotion trajectory focus on positive ones directly: feeling good in the presence of others or establishing intimacy. For motives belonging to the knowledge trajectory, the goal is to obtain information, to perform social comparisons, and to achieve. When social contacts serve these motives, they are also sustained, even when they are linked to negative emotions.

Childhood is dominated by motives on the emotion trajectory. From school age to middle adulthood, the dominant motives are on the knowledge trajectory. In this long life phase, individuals focus more strongly on acquiring knowledge and succeeding in their careers. Social contacts are also sustained when they are linked to negative emotions as long as they serve the goals of the knowledge trajectory. In late adulthood, there is once again a shift toward a dominance of the emotion trajectory of social motives. Emotions take the stage again, and the time perspective also changes. Social motives focus more on the here and now rather than...
the future. Persons in late adulthood are concerned and motivated to promote the emotional climate (Carstensen & Charles, 1998). In sum, this differentiation of the two trajectories of social motives explains the finding that emotions are more salient in the mental representations of aged persons than in those of the middle aged (Carstensen & Frederickson, 1998).

Shift in control orientation. In their life-span theory of control, Heckhausen and co-workers (Heckhausen, 1997; Heckhausen & Schulz, 1995) distinguish between two major types of regulation affordances that individuals need to orient their actions and their development appropriately during the life course: the maintenance of selection (i.e., making an appropriate choice among the variety of options that can also ensure long-term satisfaction of one’s motives) and the compensation of failure and loss (i.e., being able to compensate for inevitable failures and losses through appropriate countermeasures).

How far these two affordances can be mastered successfully depends not only on biological and sociostructural conditions along with the vagrancies of life but also on one’s personal mental regulation competence. This consists of, first, primary control strategies that are directed toward the external world and with which the individual tries to generate motive-serving effects in the environment such as learning for an examination or seeking support. Second, it consists of secondary control strategies that are directed toward one’s own internal world and with which the individual tries to influence his or her own goals, motives, emotions, and expectations. In the terminology of the internalization model, these secondary controls correspond to reflective emotion regulation.

Heckhausen and Schulz (1995) found that primary control strategies decrease whereas secondary strategies increase from early to late adulthood, because, among others, primary controls can no longer be applied so effectively owing to age-related changes in the life course, such as retirement, age-related processes of deterioration, and so forth. It seems as if these age-related experiences of loss are compensated by emotion regulation strategies of reevaluation and reinterpretation so that they do not impact negatively on emotional well-being and the motivational resources of aging individuals.

As a result, it is particularly symbolic strategies of reinterpretation that are applied in emotion episodes. These either reinterpret negative events retrospectively in a positive way or trivialize them (it could have been worse). Downward social comparisons are preferred (others have it far worse than I do), and the aged reduce the discrepancy between the ideal self and the real self. Such strategies serve to neutralize the impact of stressors and the negative emotions they trigger. In addition, the aged increasingly apply antecedent regulation strategies. For example, social partners are chosen more selectively. Above all, the aged prefer close friendships and they cultivate them more intensively than middle-aged adults.
The outcome of these shifts is to reduce the proportion of negative feelings while maintaining or even increasing the proportion of positive feelings in comparison with early and middle adulthood.

4.6. SUMMARY

The ontogenesis chapter concentrated on how children develop their emotions and learn to regulate them. We based this on the following systematic definition of emotion: An emotion is a self-organizing psychic system that assesses the meaning of internal or external, context-related causes for one’s own motive satisfaction, that triggers adaptive, emotion-specific expression and body reactions that are perceived subjectively as feelings through body feedback and brought into a relation with the cause of the emotion, so that motive-serving actions are (can be) triggered either by the individual himself or herself or by an interaction partner.

In the present chapter, we have concentrated on the prototypical course of development, and considered interindividual differences only marginally in the development of temperament and attachment. For the single phases, we have named the developmental tasks that children have to master during their emotional development, and we have described the developmental mechanisms that drive forward the development of emotions and emotion regulation within the interaction process between children and their fellow human beings.

1. The precursor emotions in neonates. Neonates do not enter our world with fully functioning emotion systems, but with precursor emotions. These are triggered by preadapted stimulus configurations and not by the particular relational meaning of the perceived causes of the emotion. Likewise, the triggered expression and body reactions are not yet oriented toward the cause of the emotion and the caregiver.

2. The emergence of sign-mediated levels of regulation in infancy. The precursor emotions only develop into functioning emotion systems that can guide actions in a motive-serving way within interpersonal regulation with sensitive caregivers. We have identified the interplay between the affect mirroring of infant emotion expression by caregivers and their motive-serving responses on the one side and the motor mimicry of the emotion expression by the child and his or her learning through experience on the other side as the decisive developmental mechanism through which fully functioning emotions evolve. It is only when the caregiver provides an appropriate interpretation to the still unfocused infant expression and body reactions, mirrors this in his or her own expression in the form of exaggerated expression signs, and responds promptly with motive-serving coping actions, that the infant’s precursor emotions are augmented to form completely
functional motive-serving emotions. The infant emotion process is accordingly initially shared between child and caregiver. They act together as a coregulative system.

We consider that this developmental mechanism can be used to explain how starting with a few precursor emotions (distress, interest, endogenous pleasure, disgust, and fright), a range of new emotion qualities emerge, such as pleasure, joy, affection, amusement, frustration, anger, defiance, fear, surprise, sorrow, sadness, and embarrassment. We assume that this developmental mechanism is not just restricted to infancy, but underlies the genesis of new emotion qualities in general. We have tried to illustrate this through the emergence of the self-evaluative emotions of pride and shame.

3. The emergence of intrapersonal levels of regulation in toddlerhood and preschool age. It is only at the end of infancy that intrapersonal regulation emerges from interpersonal regulation. Children become increasingly able to perform motive-serving actions by themselves without social support, and coordinate the satisfaction of their motives with their social environment and situational demands. This is the context in which the self-evaluative emotions emerge in the form of pride, shame, and guilt that children use to assess their actions and themselves in light of social norms.

A further development of volitional action regulation by means of speech signs leads to the ability to engage in reflective emotion regulation. Children acquire strategies to regulate their emotions, enabling them to modify the intensity and quality of their emotions in line with social norms and situational demands. The self as an integrative system of activity regulation forms through which the emotional, volitional, and the reflective levels of regulation are coordinated with each other in a more or less successful way.

Infants whose activities are still guided almost exclusively by emotions become children who, as they grow older, are increasingly able to understand that they should no longer just follow their emotions but also regulate them if they want to satisfy a higher motive. The increase in volitional and reflective parts of regulation during the course of development also explains the developmental trend according to which the frequency and intensity of emotions decrease during ontogenesis, as we have claimed in our introductory chapter.

4. The internalization of mental means of regulation after the sixth year of life. In the form of expression and body reactions, each emotion system contains an objective component that can be perceived by others. Under certain conditions—they have an exclusively intrapersonal semiotic function in action regulation—expression and body reactions can become internalized and transformed into mental expression signs. Then—in the extreme case—they are no longer objectively measurable, but can be assessed only subjectively as expression and body sensations. A mental level of expression, speech, and action emerges. This permits
subjective feelings that no longer relate to body feedback on real expression and body reactions but to their somatosensory representations.

We have identified the developmental mechanism here as the development of symbol comprehension that permits a change in the form of expression and body signs and allows mental expression signs to emerge. In this way, we can also explain why in many of the emotion episodes in adults, no equally directed changes in the expression, body, and feeling components can still be observed. This is because the internalization process makes it possible for the wholeness of the emotional expression and body reactions to be retained in subjective feeling in the form of mental expression and body sensations.
When describing ontogenesis in the last chapter, we deliberately limited ourselves to the development of emotions in western cultures alone. Nearly all the studies cited came from an Anglo-American or German context. Such an explicit limitation means that we have proceeded as if one major condition underlying human development were a constant. This is the human-made culture-historical context in which individual development takes place. We have already pointed this out in our third look at emotional development in Chapter 1.

Therefore, the central issues in the present chapter are how far the prototypical course of emotional development and the underlying developmental mechanisms are universal, and how far we can use the internalization model to explain what may be culture-specific differences in the development of emotions and their regulation.

Section 5.1 examines how far emotions are shaped by culture, and which specific components of the cultural context may impact on emotional development. Culture embraces the domain of artifacts: the objects and signs created by human beings along with their instrumental and semiotic functions (Section 5.1.1). Culture is itself an outcome of evolution. Emotions also have a phylogenetic inheritance; all mammals seem to possess them. Therefore, we start to describe the contribution of culture to emotional development by sketching phylogenetic development (Section 5.1.2). Human beings start to create systems of meaning—also called ethnotheories—by reflecting on their daily lives and social activities. Such ethnotheories are important in our context when they refer either directly or indirectly to emotions (Section 5.1.3). Ethnotheories are handed down through interactions, and a child’s socialization partners orient their childrearing behavior.
toward their own subjective ethnotheories that may well deviate to a greater or lesser extent from the given cultural model.

After this introduction to the relation between culture and emotion, Section 5.2 applies the internalization model as a theoretical framework to see which mechanisms and outcomes of emotional development can be observed in all cultures and where cultural differences may be found. Cultural comparisons are based on examples from either the United States or Germany on the one side and Japan or China on the other. We selected these countries not only because most cross-cultural research has been performed in them but also because they are the countries in which we have carried out our own studies.

At the starting point of emotional development (Section 5.2.1), we examine which characteristics are universal, and whether cultural differences can be found in, for example, temperament. In the first phase of development, the emergence of sign-mediated emotion systems, we show how the receptiveness of infants to caregivers’ expression behavior may lead to culture-specific paths of emotional development (Section 5.2.2). In the second phase, the emergence of intrapersonal emotional regulation (Section 5.2.3), our main interest is in how an autonomous regulation of emotions develops from a culture-specifically shaped interpersonal child–caregiver regulation, and which consequences these forms of regulation have for further emotional development. We then present our own cross-cultural study of 2- and 5-year-olds. Whereas the first two phases reveal universal initial features, we have to ask whether the third phase, the internalization of expression signs, is in any way universal (Section 5.2.4). Here, we present our own cross-cultural study of adults from two cultures of varying expressiveness (Germany and Spain). Comparable studies on children and adolescents are still lacking.

5.1. HOW FAR ARE EMOTIONS CULTURALLY SHAPED?

5.1.1. CULTURE, ARTIFACTS, AND PSYCHOLOGICAL DEVELOPMENT

It is a species-specific characteristic of human beings to use socially created artifacts (in the form of tools and symbols) to reshape their naturally given environment within a process of social coordination, and to pass on this culture to the following generations. These, in turn, adopt the artifacts and apply them to regulate their activity and to maintain social and cultural life (see Cole, 1996; Vygotsky, 1931/1997).

Artifacts are not just human-made objects such as tools, machines, and buildings, but also human-made symbol systems and their tangible forms such as speech or written language (Wartofsky, 1973). We would also add the nonverbal “language” of body expression. Artifacts are the vehicles of human culture. Wartofsky (1973) describes artifacts as “objectifications of human needs and intentions
already invested with cognitive and affective content” (p. 204). They are simultaneously both something real and something ideal. They are tangible and, therefore, possess an objectively perceivable form; they need this so that their use can be handed down from person to person. At the same time, they are also ideal—that is, they have a signifying form when they are used as signs; they need this so that they can serve as a means of psychological regulation. Looking at artifacts in this way transcends the dualistic controversy that views culture as being exclusively either something internal, consisting of learned symbols and shared systems of meaning, or as something purely external, consisting of handed down action procedures and material products (see Cole, 1996).

In the course of human history, the creation, generational transfer, and continuous further development of the cultural sphere has led to the emergence of a cultural form of acquiring and passing on experience. This is accompanied by a new form of psychological activity regulation mediated by symbols. Regulation no longer just follows a biological plan of development, but proceeds interactively according to a cultural one. It exploits societally created symbols, be they expression, speech, or other, that serve to exert an influence on other persons and to coordinate joint activities. From this basis, these symbols also serve to influence the self and to coordinate one’s own activities—as we have sketched when describing volitional action regulation in Section 3.4.1.

5.1.2. A RECONSTRUCTION OF THE PHYLOGENESIS OF EMOTIONS

In Section 3.1, we defined emotion as a self-organizing psychological system that appraises the significance of either internal or external context-related causes for the satisfaction of one’s own motives, and then triggers adaptive expression and body reactions. Through body feedback, these reactions are perceived subjectively as a feeling and related to the cause of the emotion so that motive-serving actions are (or can be) triggered either by the individual himself or herself or by an interaction partner (see Chapter 3).

This definition characterizes the general features of an emotion. These do not just apply to human beings. Mammals, particularly apes, also seem to be able to draw on such psychological systems (see Panksepp, 1998; Schneider & Dittrich, 1990). Emotions accordingly are part of our phylogenetic inheritance. The question is how can this phylogenetic inheritance be modified by human cultural achievements and the accompanying symbolically mediated regulation of activity.

To gain a first impression of such a cultural shaping of emotions, we shall sketch their phylogenetic development. This should reveal which components of emotion are open to modification.

Strictly speaking, a phylogenetic reconstruction of emotions would require an analysis of the psychological activity regulation of our common ancestors.
Because they are long extinct, the only remaining option is the indirect approach of making comparisons between living species that have evolved out of our common ancestors. However, these living species have a phylogenetic development behind them that is just as long as that of human beings, limiting the value of conclusions on common ancestors and their mental organization (Fridlund, 1994). As the results of comparative behavioral research likewise have to be treated with caution, the following statements must be taken as only a first rough approach to reconstructing the phylogenetic development of emotions.

**Mammals.** Panksepp (1998) and Schneider and Dittrich (1990) assume that emotional regulation is comprehensively developed in mammals and is their leading level of regulation. The single emotion qualities signalize selected need-relevant relations between the organism and its environment that are significant for survival and procreation, and they bring the organism into a state of action readiness adaptive to the mammal’s situation and need. In this context, it is meaningful to talk about species-specific basic emotions. Nonetheless, it will probably never be possible to prove that mammals also possess a feeling component.

According to Panksepp (1998), all mammals possess the emotion systems that he summarizes under the following headings:

1. Seeking (as a search for need-adequate incentives)
2. Rage (as a mobilization of forces to fend off threats)
3. Fear (as a readiness to flee in order to avoid threats)
4. Panic (as a state of distress leading to a search for social contact and care)
5. Sexual lust
6. Care (of offspring)
7. Play (as a kind of pleasure during rough-and-tumble activities with members of the same species)

**Apes (particularly chimpanzees and bonobos).** These mammals live in highly structured social groups. Emotions and their accompanying expressive reactions adopt an important social regulation function in their within-species interaction. However, performing this function adequately seems to require rehearsal of the emotions summarized under the headings of rage, fear, and care in a period of childhood play together with parents and/or peers. Studies with rhesus monkeys (see, for a summary, Buck, 1984, pp. 122–128; Suomi, 1984) show that even when raised in isolation, they will still react with fear, rage, and care. However, they cannot integrate themselves into an adult group or properly attend to the needs of their offspring. They do not interpret the facial expressions of their peers adequately, and they respond with context-inappropriate expression signs. They have not learned to adapt their emotions to their context. However, if they are brought together with young peers, they can catch up on what they have missed out, and, eventually, exhibit appropriate emotional expression reactions and interact adequately. This shows that already with the rhesus monkey, one can no longer
talk about fully functioning emotions at birth: The appropriate interplay of system components is first formed in social contact with members of the same species. In normal development, fear first emerges after social bonds have been formed to other members of the group. First rage reactions emerge even later, after the young monkey has acquired a great deal of experience in interacting with other monkeys.

Furthermore, observations of primates living in the wild and living in captivity confirm that they are able to manipulate their expression voluntarily—although only sporadically and in special situations—in order to elicit or prevent certain behaviors in their peers (Byrne & Whiten, 1991). This is a first indication of the principal ability to use expression in its symbolic function as well (i.e., to pretend to be in a specific emotional mood for deceptive purposes), although only within the framework of innate expression signs. We know of no studies in which primates have been observed to go on to invent new expression signs.

**Anthropoid sociogenesis.** The decisive “revolution” in the hominids was the creation of artifacts in the form of tools and symbols that began to mediate the activities of human ancestors and open up the possibility of a cultural evolution through symbolically conveyed learning experiences. In our context, it is interesting to look at the work of Donald (1993) and Raeithel (1994). They have both concluded that the development of the symbol function in anthropoid sociogenesis already started with gestures and expression signs (a central component of emotion) and did not first start with speech signs. This would imply that our ancestors were already able to use and pass on expression signs as symbols long before any spoken symbols came into existence. As we have shown in Section 3.3, using expression signs symbolically opens up a cultural dimension of emotional development through which new, culturally created emotion qualities can be produced. Donald (1993) considers that the anthropoid sociogenesis of the symbol function can be broken down into the following major stages.

The first stage was about 2 million years ago with the transition from *Australopithecus* to *Homo habilis*, who possessed a significantly larger brain capacity and already produced simple stone tools. These simple artifacts made it possible for a cultural evolution to commence.

The second stage was the emergence of *Homo erectus* about 1.5 million years ago, who possessed a markedly larger brain and an advanced tool tradition. This marks the beginning of a mimetic culture that was already using symbols for interpersonal communication. Consisting of iconic expression signs, gestures, symbolized actions, and ritual dances, these were probably the first symbolic forms of presentation (see also Hubert, 1992).

The third stage is the evolution of the human speech apparatus and the creation of speech signs. This began to evolve only after the evolutionary advantages of the use of symbols had become established. The speech apparatus first took its modern anatomic form in archaic *Homo sapiens*. A mythical culture, focusing on the use of speech and oral tradition, emerged only 50,000 years ago with *Homo*
sapiens sapiens. However, the mimetic meaning systems continued and continue to be used and passed down from generation to generation.

5.1.3. Ethnotheories as Culture-Specific Patterns for Interpreting Emotional Phenomena

The emergence of the mythical culture of modern Homo sapiens sapiens marks the beginning of the creation of a verbally codified sphere of meaning systems that could be, and continues to be, used to represent and reflect on social practices and societal relations. Humans became aware of their social practices and tried to conceive their knowledge about themselves and their world in verbal meaning systems. Nonetheless, the content passed on in myth and religion reveals some confusion between that which is (the social practices) and that which should be (the shared norms and values of a culture). As a result, in many cultures, norms and values were not viewed as a product of human culture but as something ordained by nature or a divinity. These traditions present person–world relations that have continued to guide human beings to this day how to orient themselves to the multitude of culturally created social relations.

Such shared meaning systems can also be viewed as “cultural syndromes” or ethnotheories characterized by a “shared set of beliefs, attitudes, norms, values, and behavior organized around a central theme and found among speakers of one language, in one time period, and in one geographic region” (Triandis, 1997, p. 443).

In our context of the psychology of emotions, two types of ethnotheory are relevant: ethnotheories containing the general norms and values for human social life and thereby also having normative consequences for the expression and feeling of emotions and their regulation; and ethnotheories in which human emotions and the forms in which they are regulated are addressed and interpreted directly.

Ethnotheories on the norms for human social life. Every culture evolves binding norms that describe and regulate social life and the underlying person–world relations to which members should aspire (see Section 4.3.1). These culture-specific person–world relations will be described in more detail in the following because they also have consequences for the expression and feeling of emotions as well as their regulation (Fiske, Kitayama, Markus, & Nisbett, 1998; Semin, Gorts, Nandram, & Semin-Goosens, 2002).

Various approaches have been formulated to structure these person–world relations, and to describe culture in terms of various value dimensions (e.g., Bardi & Schwartz, 2003; Inglehart, 1997; Schwartz & Bardi, 2001; Schwartz & Bilsky, 1987).* Hofstede (1980, 2000) performed a series of cross-cultural surveys in

*These approaches will not be presented here because we know of no studies so far dealing with how they relate to emotional phenomena.
which he defined culture as something that assumes a collectivity and marks a unique quality of a group—be it a national state, a regional group, or an ethnic group. He extracted five dimensions of person–world relations from these surveys that can be used to distinguish between cultures. These are (1) individualism, (2) power distance, (3) masculinity, (4) uncertainty avoidance, and (5) long-term versus short-term orientation. He views the values reflected in these dimensions as being fundamental, whereas rituals and symbols such as flags belong to the cultural practices based on these values. Of these five dimensions, two are particularly useful in cross-cultural studies of emotions: power distance and individualism.

Power distance describes the extent to which persons accept and expect power to be distributed unequally in the society. In cultures with a low power distance, hierarchy is viewed as an inequality of roles that is set up for the sake of convenience. Members view all persons as being basically of equal rank regardless of whether they are above or below them in the social hierarchy. In contrast, cultures with a high power distance recognize hierarchy as a fundamental inequality. Members view those above and below them as persons of different rank. In such cultures, interaction behavior is correspondingly adjusted to the status of those engaging in it.

The individualism dimension assesses the extent to which a culture gives preference to the motives, goals, wishes, and values of single individuals compared with those of the reference group (see also Triandis, 1995). Despite some criticism (Kagitcibasi, 1994, 1996; Oyserman, Coon, & Kemmelmeier, 2002), this dimension still provides a meaningful explanation of the cultural differences in many behaviors (Fijneman, Willemsen, & Poortinga, 1996), including those in the domain of emotion research (e.g., Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998).

We shall illustrate the explanatory power of the individualism dimension through the emotions anger and shame. Anger relates to the individual enforcement of own goals. It signalizes that an individual is being prevented from goal attainment or is being treated unfairly, and it leads to a readiness to act to overcome these hindrances (Barrett & Campos, 1987). Shame, in contrast, shows the readiness to subordinate oneself to the group and its norms. It signalizes that an individual has noticed that he or she has engaged in norm-deviant behavior, and it leads to the action readiness to hide oneself from others and comply with the norm in the future (Barrett & Campos, 1987).

Anger is less desirable in collectivist cultures, because it threatens the harmony of interpersonal relations. Members of such cultures tend to avoid anger-eliciting situations and do not focus on those aspects of situations that impede goal attainment. Instead, they have a greater willingness to withdraw, and they try to subdue their anger reactions. Shame, in contrast, is rated positively because this emotion induces individuals to subordinate themselves to the group (Miyake & Yamazaki, 1995).
In individualistic cultures, anger tends to be considered as appropriate and functional, because it promotes the uniqueness, independence, and self-expression of the individual. Anger in the interest of self-assertion and the protection of individual rights and freedoms is tolerated as long as it is expressed in socially acceptable ways (Stearns & Stearns, 1986). This is why members of western cultures are more inclined to seek out anger-triggering situations and maintain their anger as long as it still seems to be useful for asserting their own interests. Shame, in contrast, is considered problematic, because this emotion undermines a person’s self-esteem (Ferguson, Stegge, Miller, & Olsen, 1999).

Ethnotheories on emotional phenomena. Any comparisons of the ethnotheories on human emotions and their regulation that have emerged in different cultures reveal an overwhelming range of emotion-related interpretations. The majority can be related to the dominance of individualism in a culture. Therefore, we shall now use this dimension to illustrate how ethnotheories differ.

1. **meaning of the feeling component.** Ethnotheories differ in terms of whether an emotion tends to be viewed as the outcome of a private experience or a public experience shared with others (Matsumoto, 2001). Western cultures assign a personal significance to emotions. They are perceived and interpreted as private and internal experiences, which is why members view the feeling component as a central feature of an emotion (see Mesquita, 2001). Asian cultures, in contrast, perceive and interpret emotions as situation-related indications of relations between persons and their environment. Emotions are therefore conceived more as a function of situations and tend not to be made dependent on the actual subjective feeling of the individual (see Mesquita, 2001). The Samoans (Gerber, 1989), the people of the Solomon Islands (White, 1980), and the Fulani people (Riesman, 1977) also interpret emotions as features of relationships.

2. **Status of emotions for activity regulation.** Ethnotheories also differ in the status assigned to emotions for the regulation of actions; in other words, how far the emotional regulation level is allowed to dominate compared with the volitional and reflective regulation levels. Contemporary western cultures tend to assign emotions and their action-regulating functions a positive role for the mental well-being of the individual. Asian cultures, in contrast, tend to view emotions as action impulses that have to be controlled and overcome. In China, emotions in general are viewed as irrelevant and even dangerous, and they may even lead to illness (Klineberg, 1938; Potter, 1988; Wu, 1982). This makes moderating and controlling strong emotions and their expression a desirable goal (Russell & Yik, 1996; Sue & Sue, 1991). Intensive emotions would threaten and injure the harmony and stability of interpersonal relations (Bond & Hwang, 1986).
3. **Moral values assigned to single emotions.** Another aspect in which ethnotheories differ is in the moral value assigned to the single emotion qualities. For example, emotion qualities like pride, joy, anger, shame, or sadness, that seem to be universal may well be evaluated completely differently in a moral sense. Depending on the specific culture, these emotions may be welcome and appropriate; they may be tolerable; or they may even be unwelcome and inappropriate. As mentioned above, the induction of shame is considered problematic in western cultures but appropriate in Asian cultures, whereas the exact opposite holds for anger.

Positive emotions such as pride are rated as welcome and desirable in western countries. This is why members of such cultures seek situations that elicit pride more frequently, and try to maintain this feeling and even intensify it. In contrast, Asian cultures tend to view effusive positive emotions as inappropriate, and are dismissive of persons who openly display pride.

4. **Evaluation of causes of emotions.** Ethnotheories differ in the evaluation of the causes of emotions; in other words, they differ regarding which emotions it is appropriate to feel in which situations. Hochschild (1979) has coined the term “feeling rules” for this. She reports the example of the working life of American airplane stewardesses who are trained not only to always express friendliness toward their passengers but also to feel it.

A milder form of such feeling rules is the tenets for emotion expression stipulating which expression should be shown to whom in which situations. Which feeling the person actually feels in such situations is irrelevant. Ekman (1972) has coined the term “display rules” for this. A good example is his study of Japanese and US-American college students who viewed a disgust-inducing film in a solitary and a social interview situation. In the social condition, the Japanese college students masked their expression of disgust to a greater extent with a smile than the US-American college students, whereas neither cultural group masked its expression in the solitary condition.

5. **Preference regarding emotion regulation strategies.** Furthermore, ethnotheories differ regarding which control beliefs (see Section 4.5), and thereby which emotion regulation strategies, are considered appropriate (see Rothbaum, Weisz, & Snyder, 1982; Seginer, Trommsdorff, & Essau, 1993). In western cultures, primary control beliefs are dominant. They indicate that one should exercise control over the external environment in order to change it in a motive-serving way. There is a corresponding preference for problem-focused coping actions directed toward a motive-serving modification of the social and physical environment. In Asian cultures, secondary control beliefs are dominant. These suggest that the self should adapt to the given situation by controlling the situation’s
psychological effects on oneself (Weisz, 1990). This is accompanied by more reflective emotion regulation strategies such as calming the self, distraction, and reappraisal that will change one’s own emotion without impacting on the environment in a motive-serving way. The emotional climate of a culture may be characterized by such general control beliefs, and, in addition, such norms may also be subject to historical change (Stearns, 1994; Stearns & Lewis, 1998).

6. Modifications of universal emotions. Finally, ethnotheories also contribute to the culture-specific modifications of those emotions that are viewed as universal, such as anger, sadness, joy, or fear. When the members of a culture try to comply with the interpretations and action rules of their own culture-specific ethnotheory, feedback effects arise between the level of emotional action regulation and that of reflective emotion regulation. These may strongly modify the way in which an emotion is expressed and felt.

5.2. EMOTIONAL DEVELOPMENT IN THE CULTURAL CONTEXT

After these introductory remarks on the relation between culture and emotion, we can now examine the internalization model’s predictions regarding what is to be observed in emotional development across all cultures and where cultural differences may be found.

The ethnotheories mentioned above are shared beliefs of the members of a culture that may also vary individually. These beliefs guide parents’ childrearing behavior in the interaction with their children (Trommsdorff & Friedlmeier, 2004). The individualistic and collectivist sociocultural background and the related ethnotheories may lead to two idealized developmental paths, the former emphasizing individuation and independence; the latter, group membership and interdependence (Greenfield, Keller, Fuligni, & Maynard, 2003). The actualization of ethnotheories by parents’ educational practices is a central aspect in a theoretical framework to describe and explain culture-specific paths of emotional development. Alongside these crucial ethnotheories, such a framework also has to take into account cultural rules of interaction and cultural ideals regarding parent–child relationships (see Friedlmeier, 2005a, b; Trommsdorff & Friedlmeier, 2004; Trommsdorff & Kornadt, 2003). These two aspects will be highlighted and integrated when discussing the four phases of the internalization model.

The cross-cultural comparison in the following sections draws on examples comparing the United States or Germany on one side with Japan or China on the other. These countries have been chosen because they are the ones for which the most empirical research is available and in which we have also carried out our own studies. On the one hand, they stand for different norms on the
Individualism and Power Distance dimensions (Hofstede, 2000). On the other hand, Japan, Germany, and the United States have a similar level of industrialization, so that cultural differences can be traced back to social rather than socioeconomic factors. Politically, all three countries are also organized as democratic states.

Despite globalization and Americanization, modern Japanese culture continues to be shaped by Confucian and Buddhist thought, with its strong emphasis on harmony and individual commitment to the social group. Germany and the United States, in contrast, are cultures embedded in the tradition of Christian and western thought that places great value on individual fulfillment. These cultural differences can be viewed as relevant context conditions for emotional development.

In the following, we shall work through the four phases of the internalization model and discuss which cross-cultural and which culture-specific developmental patterns can be identified. Because the empirical database is rather meager, some aspects of the following are still only speculations.

5.2.1. Preadaptation of Infant and Caregiver as a Universal Baseline

The universal psychological endowment with which neonates of different cultures enter this world is a product of phylogenetic development. It is preadapted for life in a culturally shaped environment. This includes a general ability to acquire culturally handed down skills and knowledge within social interaction, which, in turn, presupposes a particular sensitivity for social interactions and their emotional regulation.

With regard to the emotional level of regulation, we have already listed the main preadaptations in Section 4.1. We assume that these are universal; in other words, that they are given to every neonate in every culture: All babies are receptive to temporal, sensory, and spatial contingencies; they possess the ability to engage in motor mimicry; and they all engage in sucking and gaze aversion as precursor strategies of emotion regulation. Furthermore, the ability to build up contingencies between cause, appraisal, and expression can also be taken as universal. And we also assume that one can consistently observe the precursor emotions of distress, disgust, and fright as well as interest and endogenous pleasure in all neonates (see Izard, 1978). Essentially, the first three precursor emotions serve to signalize need-related deficit states or impairments of physical integrity, whereas interest and pleasure serve to build up psychological representations of the external and internal environment (Sroufe, 1996). Although we know of no studies claiming that this basic equipment of the neonate is not universal, hardly any cross-cultural research has addressed this issue.

Temperament. Alongside this universal endowment, dispositional emotion readinesses are also significant for emotional development. These are conceived
under the term “temperament” (see Martin et al., 1994; Zentner, 1998) and include the following: negative reactivity (also known as negative emotionality or irritability) that determines the threshold for triggering distress; adaptability (or manageability) that determines how easily a child can adjust to changing situations in his or her environment; and approach/withdrawal that determines the willingness to make contact with less familiar persons (also labeled shyness). Other temperament factors such as activity level, sensory threshold, or biological rhythmicity impact only indirectly on emotional development through variations in the demands for regulation they place on caregivers.

From a cross-cultural perspective, the interesting issue is whether the temperament factors are universal, and also whether their intensity reveals a similar distribution across all cultures.

Temperament factor “negative reactivity.” The available studies on variations in negative reactivity and activity level permit no unequivocal conclusions on cultural differences. Freedman (1974), for example, found that European-American neonates displayed a higher negative reactivity and activity level during unpleasant test procedures in the Brazelton Test compared with Japanese neonates, who, in turn, were more emotionally reactive and active than Chinese neonates. However, Kosawa (1980) was unable to replicate these findings. Kagan, Arcus, Snidman, Feng, Hendler, and Greene (1994), in turn, reported that 4-month-old Chinese children had a generally lower negative reactivity (less crying, fewer vocalizations) when confronted with visual, auditory, and olfactory stimuli than European-American children. Two- to 6-month-old Japanese infants cried less and uttered fewer vocalizations when being inoculated (Lewis, Ramsay, & Kawakami, 1993) and took markedly longer to react to having their arms restrained than European-American infants of the same age (Camras et al., 1992). In nonstressful interaction situations, American infants displayed more positive emotions than Japanese infants (Caudill & Weinstein, 1969; Fogel, Toda, & Kawai, 1988). However, Otaki, Durrett, Richards, Nyquist, and Pennebaker (1986) were unable to find such differences.

It remains unclear whether the observed cultural differences were due to variations in the meaning and quality of the stimuli for the infants or referred merely to the type of reaction. Lewis (1989), for example, found that Japanese infants had significantly higher cortisol levels, which can be viewed as an indicator for stress, than the American infants during inoculation. Although the Japanese infants had stronger negative emotional reactions on the physiological level, they displayed less facial and vocal expression of distress.

In summary, findings indicate that European-American infants tend to be emotionally more reactive and active than Japanese and Chinese infants. Nonetheless, it cannot be ruled out that caregivers also exert an influence on these differences, and they may even elicit them through culture-specific interaction behavior. Indeed, the daily task of caregivers is to regulate their infant’s emotions
through their interventions, and infants are highly capable of adapting to the behavior contingencies they present. Dong and Pang (1995) have reported that Asian children are more restricted in their motor activity than American children because they are frequently carried in body slings as well as being swaddled. Other studies have shown that these practices are an effective way of calming unruly infants.

However, studies of older infants no longer reveal any differences in negative reactivity. Camras et al. (1998) reported that at the age of 11 months, Japanese and European-American infants no longer differed in the speed with which they reacted to having their arms restrained with an expression of frustration (prompt and loud crying).

**Temperament factor “approach/avoidance.”** As far as this shyness factor is concerned, we can now clearly trace how genetically influenced behavior characteristics and sociocultural influences can interact and lead to different developmental outcomes in terms of the children’s socioemotional competence, as conceptualized in the Goodness-of-Fit Model of temperament (see Zentner, 1998).

Hence, on the one side, there are strong indications for a genetic component in shyness and that it is therefore anchored biologically: In a meta-analysis, Goldsmith, Buss, and Lemery (1997) showed that monozygotic twins exhibit very similar approach behavior, whereas this is not the case for dizygotic twins. Moreover, in a longitudinal study, Kagan and Snidman (1991a, 1991b) managed to identify precursors for this temperament characteristic in neonates (who are too young to display shyness): Infants aged 14 months who displayed stronger social anxiety and less exploration behavior (i.e., could be classified as shy) responded highly reactively (wild gesticulations and crying) at the age of 4 months to a test battery of visual, auditory, and olfactory stimulation. In contrast, children who were less reactive at the age of 4 months also displayed little social anxiety and strong exploration behavior at the age of 14 months. These interindividual differences could still be observed in these children at the age of 4 1/2 years, suggesting a high temporal stability (Kagan, 1997).

On the other hand, longitudinal studies were able to confirm that shyness only impacts negatively on the development of socioemotional competence in childhood and adolescence when such children are exposed to chronic stress in their social context. This interaction between temperament characteristics and the sociocultural context can also be seen in an intercultural comparison reported by Chen et al. (1995): They were able to show that socially anxious children from China tended to be accepted by their peers during early and middle childhood and showed no socioemotional problems, whereas socially anxious children from western cultures were less well accepted by their peers and also had more socioemotional problems.

We can explain these intercultural differences through cultural differences in the expectations that caregivers impose on their children: American caregivers
expect the self-confident and competitive behavior that is characteristic of individualistic societies. They express their disappointment over the social behavior of an inhibited child and react with rejection and punishment. Such a child is also less well accepted in the peer group.

In contrast, a social orientation and interpersonal harmony are central norms in both traditional and contemporary Chinese society. Individuals are encouraged to inhibit their personal needs and wishes and give priority to those of the group (Ho, 1986). Therefore, the goal of socialization is for children to learn to develop group-oriented beliefs. Even 4-year-olds are urged to control their emotions and behaviors in this sense. These collectivist ideas are imparted during schooling through participation in extracurricular groups. Children are encouraged to be cooperative and build up harmonious relations with peers. The way educators evaluate individual behavior is oriented toward the interests of the group, and these evaluations are made public by, for example, announcements on the school notice board. This procedure encourages the formation of a feeling of shame that motivates individuals to improve performance and contribute more while remaining reserved and modest.

In such a context, socially anxious and inhibited behavior is evaluated as reserved behavior and therefore as being socially mature and competent. Children exhibiting it gain the attention and the acceptance of their educators. This encourages acceptance in the peer group. Furthermore, owing to the low mobility rate in China—children tend to spend all their school life in one location—familiar social networks emerge that make it easier for socially anxious children to interact successfully and protect them from the social anxiety triggered particularly by having to deal with new situations.

Chen, Rubin, Li, and Li (1999) followed up their children 4 years later in their sixth and eighth school grades. They assessed self-perceived competence and self-esteem as well as popularity and social position in the peer group. Whereas in the American studies, socially anxious children became adolescents with socioemotional adjustment problems such as academic failure, negative self-perceptions of competence, and less acceptance among peers (Rubin, Chen, & Hymel, 1993; Rubin, Chen, McDougall, Bowker, & McKinnon, 1995), the socially anxious Chinese children continued to be accepted by peers in adolescence, they were academically successful, and they even took on leadership positions within the class and on the school and/or municipal level. Such “leaders” were elected by peers and teachers and were usually believed to be good students. They had a positive self-perception of competence and positive self-esteem, and their teachers continued to evaluate them as being competent.

The results of this study point to the critical role of socialization partners who may differ in how they react to the same behavior as a function of their culturally shaped values and childrearing attitudes. This may well lead the social and emotional development of the children to take different paths.
5.2.2. The Emergence of Sign-Mediated Emotion Systems

The internalization model assumes that the transformation of the neonate’s precursor emotions into the sign-mediated emotions of the toddler is a universal phenomenon. However, how successful such a transformation will be depends on intensive interaction between infants and their caregivers. Caregivers interpret the still unfocused infant expression and body reactions against the background of their emotion-related ethnotheories, mirror them more or less strongly in their own expression as exaggerated expression signs, and respond promptly with motive-serving actions. We assume that affect mirroring and vicarious regulation behavior is also something that caregivers practice in all cultures.

However, given that there are culture-specific ethnotheories about emotions (see Section 5.1.3), we can anticipate that affect mirroring will focus selectively on single emotions, and that some infant reactions will either be ignored or any emphasis on them will be countered with distraction strategies. The less that caregivers mirror a certain emotion expression, the more unlikely it is that the children will build up a categorically discernable feeling state from their emotional reaction. This could mark the beginning of culture-specific differentiation in the expression and feeling of single emotion qualities.

Furthermore, we anticipate that culture-specific ethnotheories will lead to differences in the strategies with which caregivers try to regulate the emotions they perceive in their children. This could contribute to the formation of culture-specific differences in the frequency and intensity of single emotion qualities as well.

Hence, central issues in cross-cultural studies are at what stage of development and to what extent parents from different cultures mirror the emotional expression signs of their children, in what way they engage in an interpersonal regulation of their children’s emotions, and what effects this has. Understanding these issues requires information on:

1. How cultures differ in the way that the expressive reactions and the regulation strategies develop in emotionally relevant situations during the first 2 years of life.
2. How caregivers react in these situations. How far do they mirror their children’s expression signs? Which strategies do they use to regulate infant emotions? How far do they in any way expose their children to emotion-triggering situations, or do they already try to avoid such situations in advance by using antecedent strategies?

To the best of our knowledge, these questions have not yet been studied systematically. Nonetheless, it is possible for us to put together some indirect indications, which we shall then interpret in terms of our internalization model.
Cross-cultural comparisons of expression signs for anger and fear in 1-year-olds. Camras et al. (1998) provide the first major contribution on cultural differences in the expression signs that children exhibit during the first 2 years of life. They studied the emotional expression of 24 Chinese, 24 Japanese, and 24 American 11-month-olds in two situations that earlier studies had shown to trigger fear and anger in babies from western cultures. Anger was elicited by restraining the babies’ arms; fear, by a gorilla head on a tabletop that, powered by remote control, crawled toward the infant while emitting unpleasant sounds. Mothers sat next to their infants, but were instructed not to intervene. The authors analyzed only the facial expression of the children and not the behavior of their mothers. Alongside more global measures such as smiling and crying, they analyzed single expression movements with the Baby FACS. They coded both, the two baselines and the two stimulus conditions. This covered the duration of expression (percentage within the period of observation), its variability (number of different expression configurations), and its lability (frequency of change of expression).

The first major finding is that the same repertoire of expression was available to the children from all three cultures: 21 of the total of 22 coded action units were displayed by at least one child in each culture group. Seven action units occurred frequently and were subjected to further analysis. These were smile mouth, cheek raised and/or lower eyelid raised (both as signs of joy), mild-to-intense cry mouth (negative emotion), brow lowered (anger, disgust), nasolabial furrow deepen (sadness), brow raised and contracted (fear), and brow raised (surprise).

In the baseline conditions, American children displayed smile mouth more frequently than Japanese children, and Japanese, in turn, more frequently than Chinese. In the arm restraint and gorilla conditions, Americans displayed mild-to-intense cry mouth more frequently than Chinese, and brow lowered more frequently than Japanese and Chinese. Japanese children, in contrast, once again displayed a mild-to-intense cry mouth and a nasolabial furrow deepen more frequently than Chinese. There were no differences for brow raised and contracted, but Japanese and Chinese did display brow raised more frequently than Americans (Chinese children particularly in the gorilla condition).

These results can be interpreted in terms of the emotions and the appeals signalized by the expression signs (see also Tables 3.2 and 3.3): American children displayed more joy in the baseline conditions and thus appeals to make contact (let’s play!) than the other two groups. In the arm-restraint condition designed to induce anger, they displayed more anger and thereby appeals for the partner to stop blocking their goals. In contrast, Japanese children displayed more sadness and thus appeals for consolation and help. In the gorilla condition, Japanese and Chinese children more frequently displayed surprise instead of fear.

In all, Chinese children produced the shortest duration, variability, and lability of expression, whereas there were no or only slight differences between Japanese and American children in these codings.
Unfortunately, this study focused exclusively on the direct reactions of the infants and completely neglected their interaction behavior. Although their mothers were seated right next to them, the authors did not examine how far they turned toward their mothers and applied their expression behavior as directed appeals. The study also did not analyze how far the mothers in turn reacted with affect mirroring. Such analyses would be important topics for future cross-cultural research.

*Universal receptiveness for caregivers’ expression behavior in infants.* Infants from different cultures seem to possess an ability to be receptive toward the expression behavior of their caregivers. This assumption is supported by a cross-cultural study of Chinese and Canadian babies that tested receptiveness with the so-called still-face paradigm (Kisilevsky *et al.*, 1998). This is an experimental setting containing the following three phases (see Weinberg & Tronick, 1996): (1) Face-to-face interaction: Mothers play with their babies face to face. (2) Still-face interaction: After 2–3 min, mothers adopt a neutral emotional expression in face and voice, so that they no longer respond contingently to infant expression signs. (3) Return to face-to-face interaction: The mothers switch back to responsive interaction behavior.

Numerous studies in western cultures have shown that the noncontingent behavior of the mother during the still-face interaction triggers motor unrest and negative expression signs in infants over the age of 3 months directed toward making the mother return to responsive interaction behavior. Because the mothers are instructed to ignore these appeals as well, the infants finally respond with an increased aversion of gaze from the mother. During the return to face-to-face interaction, the infants respond to the renewed contingent maternal behavior not only with expression signs of joy (smiles and positive vocalization) but also with further negative expression signs. This behavior in the second and third phases shows that babies register the change in their mothers’ expressive behavior and try to influence this through appropriate expression signs.

Kisilevsky *et al.* (1998) managed to induce the still-face effect by applying the above maternal interaction behavior in both Canadian and Chinese 6-month-olds. Hence, the receptiveness of babies for the expression behavior of their caregivers seems to be universal.

*Culture-specific differences in the interaction behavior of caregivers.* There are some indications that caregivers from Asian and western cultures differ in the extent of their affect mirroring. Chinese and Japanese mothers seem to mirror and reinforce the emotional expression in their babies to a lesser extent. American mothers of Chinese descent, for example, do not seem to place much value on the emotional expression of their babies, and they do not encourage their babies to display it by reflecting their baby’s expression of joy in their own expression (Kagan, Kearsley, & Zelazo, 1978).

There are also indications that caregivers from Asian and western cultures differ in the strategies with which they try to regulate the emotions of their
children—particularly their negative ones. This also seems to influence the frequency with which children display negative emotions. Self-reports of Japanese mothers indicate that they respond more strongly to negative emotions in their children than to positive ones. They prefer to hardly ever display an expression of anger to their children, and they do their best to prevent infant crying and screaming (Doi, 1973; Lebra, 1976; Miyake, Campos, Kagan, & Bradshaw, 1986).

Findings from a questionnaire study of Japanese and US-American mothers by Rothbaum and Morelli (2005) confirm these preferences. Mothers were asked at what stage they would intervene to regulate the emotions of their child. Unlike US-American mothers, Japanese mothers tried much more strongly to ensure that their child did not experience any negative emotion episodes in the first place. As a result, they already intervened proactively before potentially negative emotion episodes appeared. Such interaction behavior is called “proactive sensitivity” (see also Trommsdorff & Friedlmeier, 1993). In contrast, most mothers in western countries reported exhibiting reactive sensitivity, only intervening regulatively when their child was already experiencing a negative emotion. Most mothers in both cultures (79% in Japan; 90% in the United States) agreed that proactive sensitivity would encourage accommodative behaviors (e.g., empathy, agreement) more strongly than individualistic behaviors (e.g., exploration, independence, self-assertion) and that the opposite would be the case for reactive sensitivity (93% in Japan; 100% in the United States).

In line with this proactive sensitivity aimed toward avoiding negative infant reactions, Japanese mothers also orient the behavior of their children less toward external stimuli in their environment (Bornstein et al., 1992), they introduce fewer changes and new stimuli into interactions with their child, and they also make fewer attempts to manipulate the attention of their children than American mothers do (Kucher, 1989, as cited in Camras et al., 1998). These findings can be interpreted as indicating that Japanese mothers avoid situations that could overstimulate their children and thereby perhaps induce negative emotions. However, this also means that they provide fewer situations in which their children may discover and actively confront new effects that would elicit positive emotions and encourage their independence and intrapersonal regulation.

One consequence of these differences could be that Japanese infants are exposed to fewer elicitors of emotions than American infants in general—either positive or negative—and that they also have less experience in dealing with new objects. This could explain why the Japanese babies in the study of Camras et al. (1998) responded to the gorilla head with an expression indicating surprise rather than the intended fear (see last section). An expression of surprise indicates that one is involved in exploring an unusual object, but it has not yet been appraised as threatening. American infants, in contrast, responded with an expression of fear, because they already appraised the gorilla head as a threat.

An intercultural longitudinal study could explain whether, on the one hand, both Japanese and American children initially respond to such unusual objects
with surprise and then with fear, and whether, on the other hand, this ontogenetic sequence emerges later in Japan than in the United States. Furthermore, such a study could examine how far Japanese mothers exhibit more proactive sensitivity and whether this leads to less negative emotions in their children. We assume that mothers from western cultures, in contrast, would display more reactive sensitivity, leading their children to experience more negative emotions.

5.2.3. The Emergence of the Intrapersonal Regulation of Emotion

In the transition from interpersonal to intrapersonal regulation, children have essentially two tasks to master: They must learn to carry out motive-serving actions by themselves, and they must learn to view their emotions and the actions they prompt from the perspective of other persons and coordinate the satisfaction of their own motives with those of these others. The internalization model of emotional development considers that these are universal tasks during this phase of development that have to be mastered by children in all cultures.

However, culture-specific differences should emerge when one looks at how strongly the motives of children are allowed to become individualized and which consequences this has for the emotional regulation of actions. This should reveal marked differences between cultures with a collectivist versus an individualistic orientation, as already pointed out above when describing emotion-related ethnotheories (see Section 5.1.3). The internalization model can be used to generate three questions that might reveal culture-specific differences:

1. At which age do children from different cultures learn to perform motive-serving actions by themselves, and which motive-serving actions are these? How far is social life within the single cultures in any way organized so that members have either the opportunity or the need to carry out motive-serving actions intrapersonally? This is an important question, because carrying out these actions solitarily requires much more competence in self-regulation than performing them within a direct social interaction in which others could intervene and support (or compel) one to behave in a culturally appropriate way.

2. What role do the self-evaluative emotions pride, shame, and guilt take in orienting children’s motives and actions toward the values and norms of the specific culture? For example, collectivist and individualistic cultures differ clearly in the frequency with which shame is experienced and discussed among adults. However, we do not know whether shame episodes are simply less visible in individualistic cultures (see Scheff, 1988) or whether they actually are less common than in collectivist societies. There is no systematic cross-cultural research on how these emotions are socialized during childhood and which childrearing practices are applied. This is an important future topic for longitudinal cross-cultural research.
3. Which strategies are preferred for regulating emotions in different cultures, and at what age are they learned? Intrapersonal regulation also requires children to master emotion-focused regulation strategies so that they can control and neutralize their own negative emotions in situations in which the satisfaction of their own motives is being blocked. Up to now, how far children learn a culture-specifically appropriate way of dealing with frustrating events has only been examined unsystematically.

Own Studies on Cultural Differences in Emotion Regulation. Research questions. Our own cross-cultural studies have focused on the last set of topics, examining how far children and their mothers respond in culture-specific ways to frustrating events that happen either to the child or to a playmate, and how such potential differences evolve (see Friedlmeier, 2003, 2005a; Friedlmeier & Trommsdorff, 1999; Trommsdorff, 1995; Trommsdorff & Friedlmeier, 1999). We studied the following research questions in 2- and 5-year-old girls* and their German and Japanese mothers:

1. Would we be able to observe culture-specific differences in how German and Japanese children react to frustrating events as a function of increasing age?
2. Would Japanese and German mothers show culture-specific preferences in the emotion regulation strategies (problem- vs. emotion-focused) they apply when their child is exposed to a frustrating situation?
3. Would the children show culture-specific differences in the development of empathy in situations in which a playmate experiences frustration?
4. Does progress toward an intrapersonal engagement in motive-serving actions start at different ages in the two cultures?

Drawing on the emotion-related ethnotheories and culture-specific values described in Section 5.1.3, we looked for hypotheses on which culture-specific differences we expected to observe in Japanese versus German mother–child dyads.

Individualistic cultures. If it is desirable within a culture for members to be able to (and also have to) pursue their own personal wishes and motives, as in the individualistic German culture, then children would need to develop the following abilities:

1. Perceiving their emotions comparatively precisely as subjective feelings indicating how far the given situation satisfies their motives. This also includes the formation of anger as an emotion assessing how far other persons block the satisfaction of one’s own motives, and possibly do this

*Because we carried out very detailed observations, we could not assess large samples. Gender differences being anticipated, we decided to keep gender constant and only study girls.
intentionally. The expression signs accompanying anger basically serve to deliver a threat to this other that will make him or her desist from blocking this goal. Anger reactions are accordingly functional and also socially acceptable—as long as persons can use them to defend themselves from unjustified goal blockages by others, and the expressive reaction remains within accepted bounds.

2. **Learning to perform problem-focused coping actions (or primary control strategies).** Children can use these to try to influence their material and social environment in ways that will satisfy their individual motives.

3. **Learning emotion-focused coping actions.** Children can use these to tone down negative emotions when the motives they signalize cannot be satisfied.

4. **Learning empathic reactions.** When coordinating their own motives socially, children should also be able to grasp the emotions of another person (see Eisenberg, 1986; Friedlmeier, 1993). A precursor ability of empathy is emotional contagion: Babies can become “infected” with the emotional expression of another person and “catch” the same emotional state that their interaction partner is expressing (see Hoffman, 1982, 2000). Therefore, a baby witnessing an interaction partner experiencing a mishap can “catch” this partner’s distress and get distressed too. Empathy as differentiated from emotional contagion emerges between the ages of 18 and 24 months with the development of a global self-concept permitting a conscious differentiation between self and others (Bischof-Köhler, 1989). When such older infants witness a partner in a misfortunate situation, they will tend to exhibit prosocial behavior. They are no longer infected by the other’s distress (Friedlmeier, 1993, 2003; Trommsdorff, 1995; Trommsdorff & Friedlmeier, 1999).

**Collectivist cultures.** However, if it is desirable within a culture for members to pursue the well-being of the social reference group and the satisfaction of wishes and motives shared by the community, as in the Japanese culture, children would need to develop the following abilities:

1. **Controlling anger.** When members of their social reference group block the satisfaction of their motives, children should not respond with anger or, at least, tone it down relatively quickly, because displaying this emotion in their expression will have a confrontational impact that disrupts the harmony of the group. “Permissible” negative emotions are ones that appraise the situation “only” as not satisfying one’s own motives, without relating this to another person’s intent. This is the case with disappointment or with distress, which is based on an even more unspecific appraisal and is accompanied by a pressing appeal for help.
2. Learning problem-focused actions so that one can satisfy one’s motives by oneself. Although children in a culture with a collectivist orientation have to learn such actions, there is no pressure on them to learn such independence at the earliest possible age. It can be assumed that they learn the transition to an intrapersonal regulation at a later age than children from a culture with an individualistic orientation.

3. Learning to control socially undesirable emotions. Because the fit between individual and commonly shared wishes and motives is so important in a culture with a collectivist orientation, children should learn how to tone down or completely neutralize emotions that are incompatible with these social requirements. This leads to a stronger need to learn emotion-focused regulation strategies (or secondary control strategies), particularly ones that may modify the quality of an emotion such as engaging in distraction or reinterpretation.

4. Learning empathic reactions. Particularly in cultures with a collectivist orientation, great emphasis should be placed on developing empathy, because it increases sensitivity toward the emotions of others and induces corresponding actions to help. This could lead us to assume that children from such cultures would have to learn empathic reactions at the earliest possible age. However, this is contradicted by the fact that empathic reactions call for a certain degree of self-regulating behavior when faced with negative emotion episodes. The close mother–child relation in Japanese dyads provides a strong protection against feeling negative emotions, making intrapersonal regulation necessary only at a relatively late age. Therefore, it can be assumed that Japanese children will be able to show empathic reactions to the distress of another person only at a later age.

Formulating hypotheses. These considerations lead to the following hypotheses:

1. In a frustrating situation, Japanese children will react with increasingly weaker negative emotional expression as they get older, whereas emotional expression will not decline as a function of age in German children.

2. When Japanese children experience a frustrating situation, their mothers will particularly apply emotion-focused regulation strategies, whereas mothers of German children will prefer problem-focused ones.

3. Japanese children will react to the negative emotional reaction of a playmate with stronger distress than German children. Empathic reactions will emerge at a later age in Japanese compared with German children.

Experimental design. A total of ninety 2- and 5-year-old German and Japanese girls and their mothers were observed in two frustrating situations: experiencing
personal frustration and experiencing the frustration of a playmate. We coded the children’s emotional reactions, their regulation strategies, and the regulation strategies of their mothers. Independent variables were (1) cultural group, (2) children’s age, (3) type of frustrating event (one’s own vs. other’s experience), and (4) maternal sensitivity in the frustrating situation. Maternal sensitivity can be viewed as a universal characteristic revealing how precisely caregivers perceive the child’s expressive appeal and how appropriately they respond to it (see Section 4.2.4). It can be assumed that the more sensitive caregivers are, the more successfully they can regulate the emotions of their child. Hence, different culturally adaptive reaction patterns should be particularly observable in children of sensitive mothers.

**Frustrating situation.** The 2-year-olds played with a doll’s house that was suddenly taken away by an unfamiliar female experimenter. The 5-year-olds had to paste together a picture in a set amount of time, and an unfamiliar female researcher simply took the picture away with her before it was finished. In both cases, another person was the cause of the goal blockage, providing the necessary preconditions for an anger reaction. *The following dependent variables were assessed:*

1. **Course of expression intensity.** Intensity of expression was assessed by coding facial gestures, limb movements, and posture for 10-s intervals on a 6-point scale with the poles *no negative expression* (1) and *very strong negative expression* (6). The course of expression intensity was plotted by repeating this coding at four timepoints: (a) before the frustrating event (baseline), (b) immediately following the frustrating event, (c) about 1 min later, and (d) about 2 min later.

2. **Maternal interpersonal regulation strategies.** The following emotion-focused strategies were coded: (a) calming in the form of a reassuring smile, (b) distraction by, for example, encouraging another form of play, and (c) reinterpretation in the form of a verbal commentary to reduce frustration. Only one problem-focused strategy was coded: explanations of the emotional state or comments on how one might deal with it. Strategies were coded dichotomously (0 = present; 1 = not present).

3. **Maternal sensitivity.** Maternal warmth and responsiveness were both rated on 6-point scales and aggregated to form one “sensitivity” scale because both subscales correlated highly in all four groups. A culture- and age-group-specific median split was used to distinguish between less and more sensitive mothers in each group.

**Empathic situation.** The girls witnessed a mishap of a familiar adult playmate in a play situation and her expression of sadness about this. As a culture- and age-appropriate trigger of empathy or distress, the 2-year-olds saw how the arm of

*Naturally, both the doll’s house and the picture were returned to the children after the experimental inductions.*
a teddy bear came off when the playmate started to undress it for its bath. With the 5-year-olds, the playmate had made human figures out of balloons for both herself and the child. The child saw how the playmate’s “balloon man” burst. For the 2-year-olds, mothers were present but instructed to remain passive. No mothers were present for the 5-year-olds. The following dependent variables were assessed:

1. *The intensity of distress and empathy expression.* These were both rated on a 6-point scale with the poles *no signs of expression* (0) and *very strong signs of expression* (5). Facial expressions and gestures were assessed in the way proposed by Eisenberg, Fabes, Bustamante, Mathy, Miller, and Lindholm (1988).

2. *Regulation strategies in the 2-year-olds.* As the mothers were present but instructed to remain passive for this age group, we coded the child’s regulation strategy. We distinguished between three forms: (a) seeking physical closeness or body contact to mother, (b) seeking eye contact with mother without approach (emotional referencing), and (c) no contact with mother. The first two strategies are interpersonal; the latter, intrapersonal.

**Results on emotion expression in the frustrating situation.** The degree of expression intensity directly after the event revealed a significant age effect, $F(1, 82) = 8.70, p < .01$, and culture effect, $F(1, 82) = 33.03, p < .001$. However, both need to be interpreted in light of the likewise significant disordinal interaction effect, $F(1, 82) = 17.34, p < .001$ (see Figure 5.1).

![Figure 5.1](image-url)
This reveals that the negative expression intensity scarcely differed between Japanese and German 2-year-old girls, but differed markedly between the two 5-year-old groups. As hypothesized, negative expression was clearly lower in the Japanese 5-year-olds compared with either Japanese 2-year-olds or German 5-year-olds.

Analyses of the course of expression intensity revealed a significant interaction effect between culture, age, and maternal sensitivity. The course did not differ between German and Japanese 2-year-olds, and it was also not influenced by maternal sensitivity in this age group. In the 5-year-olds, in contrast, there were clear cultural differences as a function of maternal sensitivity (see Figure 5.2): German 5-year-olds with highly sensitive mothers reacted with a more intensive negative expression that only ebbed very slightly over time, whereas Japanese 5-year-olds with highly sensitive mothers reacted with a weaker expression that then dropped back to the baseline.

In contrast, emotion expression in Japanese girls with lowly sensitive mothers started on and stayed at the highest negative level, whereas in the German girls, it did not increase so strongly in the first place and then dropped back to the baseline.
TABLE 5.1. Regulation Strategies of Japanese and German Mothers in the Frustrating Situation

<table>
<thead>
<tr>
<th>Type of strategy</th>
<th>Japanese mothers</th>
<th>German mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-year-olds</td>
<td>5-year-olds</td>
</tr>
<tr>
<td></td>
<td>(n = 19)</td>
<td>(n = 20)</td>
</tr>
<tr>
<td>Emotion-focused strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calming</td>
<td>89.47%</td>
<td>40.00%</td>
</tr>
<tr>
<td>Distraction</td>
<td>29.41%</td>
<td>73.68%</td>
</tr>
<tr>
<td>Reinterpretation</td>
<td>31.58%</td>
<td>75.00%</td>
</tr>
<tr>
<td>Problem-focused strategies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Explanation</td>
<td>68.42%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Only the 5-year-old German and Japanese girls with sensitive mothers revealed a course of negative emotional expression in line with the anticipated cultural differences. Among the 2-year-olds, there were no culture-specific effects, not even in children with highly sensitive mothers. Hence, our hypothesis could only be confirmed in part.

Results on maternal regulation strategies in the frustrating situation. Log-linear analyses on the emotion-focused strategies produced the following results: The strategy of calming with a reassuring smile revealed a significant interaction effect of age group and culture, \( LR-\chi^2(1) = 9.32, p < .01 \): Japanese mothers of 2-year-olds applied this significantly more frequently than the other three groups of mothers (see Table 5.1). The strategy of distraction also revealed a significant interaction effect, \( LR-\chi^2(1) = 6.10, p < .05 \): It was applied by almost three quarters of the Japanese mothers of 5-year-olds compared with only just over one quarter of German mothers. It was relatively infrequent among the mothers of 2-year-olds (see Table 5.1). The reinterpretation strategy revealed main effects for both culture, \( \chi^2(1, N = 85) = 13.80, p < .01 \), and age group, \( \chi^2(1, N = 85) = 9.36, p < .01 \). Mothers of 2-year-olds used reinterpretations less frequently than mothers of 5-year-olds, and Japanese mothers used this strategy less frequently than German mothers. The interaction effect failed to attain significance, \( LR-\chi^2(1) = 0.96 \), although there were clear differences between Japanese mothers of 2-year-olds versus 5-year-olds on the descriptive level. The sample size was probably too small for the differences to attain significance (see Table 5.1).

Turning to the problem-focused strategy, log-linear analysis revealed a significant interaction effect here as well, \( LR-\chi^2 (1) = 5.98, p < .05 \). This strategy was applied particularly by German mothers. The majority of Japanese mothers of 2-year-olds also commented on the emotion and/or its cause. However, none of the Japanese mothers of 5-year-olds applied this strategy (see Table 5.1).
The cross-cultural comparison shows that German mothers took no account of their child’s age in their regulation strategies. Whereas Japanese mothers applied more nonverbal strategies such as reassuring smiles with 2-year-olds, German mothers also frequently attempted reinterpretations. German mothers particularly favored problem-focused strategies that were no longer used at all by the mothers of 5-year-old Japanese girls. German mothers granted their child the right to protest, thus focusing on the cause of the emotion and the child’s negative reaction. As a result, the child’s negative expression hardly weakened. One can also view this as a form of affect mirroring. In contrast, Japanese mothers preferred emotion-focused strategies and differentiated these according to age: nonverbal reassuring in 2-year-olds and distraction and reinterpretation in 5-year-olds. Japanese mothers distracted their child from the negative event by providing a framework of continuity through reinterpreting the situation and getting their child to carry on with her task.

Results on emotion expression in the empathy situation. A 2 × 2 (Culture × Age) ANOVA for empathy as dependent variable revealed no effects. However, when distress was used as the dependent variable, significant main effects emerged for both culture and age group. The negative expression intensity was stronger in the 2-year-olds compared with the 5-year-olds, and Japanese girls reacted with a stronger negative expression than German girls (see Table 5.2).

We compared the negative expression intensity in this empathy situation with that in the frustrating situation, taking the intensity directly after the frustrating event for this comparison. The MANOVA revealed a three-way interaction effect between age group, culture, and type of situation, \( F(1, 79) = 6.80, p < .01 \): In the

<table>
<thead>
<tr>
<th>TABLE 5.2. Expression Intensity of Empathy and Distress in the Empathy Situation and of Frustration in the Frustrating Situationa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional reaction</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>Empathy</td>
</tr>
<tr>
<td>2-year-olds (n = 19)</td>
</tr>
<tr>
<td>5-year-olds (n = 17)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Distress</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Frustration</td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
</tbody>
</table>

aSix-point scale with the poles 1 (not displayed) and 6 (very intensively displayed). Values represent mean, with standard deviation given in parentheses. Means with the same letters appended do not differ significantly. A = Age, B = Culture, C = Interaction. **p < .01. ***p < .001.
2- and 5-year-old German girls, negative expression was much stronger in the frustrating situation than in the empathy situation. In Japanese girls, in contrast, only the 2-year-olds displayed a stronger negative expression in the frustrating situation compared with the empathy situation. The 5-year-olds toned down their negative expression in the frustrating situation to such an extent that there was hardly any difference in intensity compared with the empathy situation. Hence, their negative emotional reaction now scarcely distinguished between a self-experienced and a vicariously experienced frustration.

These results also fit in with findings on the extent of empathic reactions. Although there were no significant effects when the intensity of empathic reactions was applied as a measure (see above), it was another story when we analyzed which reaction was dominant: either empathy or distress. Results showed that whereas both 2- and 5-year-old Japanese girls predominantly showed distress reactions, this was only the case for the 2-year-old German girls. Almost one third of 5-year-old German girls showed empathic reactions (see Figure 5.3).

Two important comments need to be added here: (1) The importance of interpersonal regulation was also disclosed by pretests showing that it was impossible to implement the empathy situation without the presence of the mothers in either of the two cultural groups of 2-year-olds. (2) For the Japanese children, spatial

![Figure 5.3](image-url) FIGURE 5.3. Dominant emotional reaction in 2- and 5-year-old Japanese and German girls in the empathy situation.
proximity and body contact with mother were even more important than they were for German children. This was revealed when we tried to implement the empathy situation in Japan. It was not possible to fully duplicate the experimental design used in Germany, where the mother had been seated in one corner while her child played with the playmate in the center of the room. In Japan, we had to bring mother and child closer together (see the sequence analyses in Friedlmeier & Trommsdorff, 1999; Trommsdorff & Friedlmeier, 1999). For the 2-year-olds, we found that interpersonal regulation was still dominant in both cultural groups (German girls: 88.24%, n = 15; Japanese girls: 73.68%, n = 14; \(\chi^2(1, N = 40) = 1.21,\) ns). However, a closer analysis of the two forms of interpersonal regulation (body contact vs. eye contact) revealed a culture effect: Even though the distance to mother was already lower during the play phase, the 2-year-old Japanese girls more frequently sought body contact with their mothers (92.86%), whereas more German girls (40.00%) were satisfied with eye contact alone, \(\chi^2(1, N = 29) = 4.27, p < .05\) (see Friedlmeier & Trommsdorff, 1999).

**Summary and conclusions.** In view of the paucity of studies on the transition from inter- to intrapersonal regulation, any general statements and interpretations still remain highly speculative and require further empirical testing in cross-cultural studies. Nonetheless, the studies reported here do give an initial insight into culture-specific processes. The behavior of mothers and children disclosed here shows a clear culture-specific adaptation: A culture-specific shaping of emotions occurs within the process of interpersonal emotion regulation.

In a cultural context with an individualistic orientation like Germany, caregivers tend to view themselves and their children as independent and autonomous, although they still intervene supportively in the development of their child’s own independence. A child’s overt negative emotional expression is considered to indicate the authenticity of the feeling and a child has a right to display such a negative feeling in the relationship if the cause of the emotion justifies such a reaction (see Trommsdorff & Friedlmeier, 1999). Therefore, in Germany, a forceful emotional expression when legitimately disappointed or frustrated is something that tends to be encouraged in a child. When the situation is emotionally stressful, mothers intervene by calming their child, but they simultaneously also reinforce the child’s feeling and affirm its appropriateness. The way that German mothers encourage their children to experience their self-related feelings promotes the formation of an emotion concept that assigns a central role to the personal contributions to the emergence of an emotion. The focus of attention is on one’s own person and the legitimately felt emotion. This may well be one reason why German children learn to view their emotions as an authentic part of their personalities at an early age. This simultaneously promotes the development of an independent self-construal.

In a cultural context with a collectivist orientation like Japan, an interdependent self-construal is held in high esteem. Therefore, the expression of
negative emotions—particularly anger, which could lead to a confrontation between group members—is undesirable. Mothers concentrate on applying emotion-focused strategies, focusing on calming younger children and distracting older ones. These strategies seem to discourage children from paying attention to their internal processes, and lead them to ignore similar events in the future. With this approach—and thereby through not mirroring the emotion—little attention is given to what the individual child contributes to its emergence. Instead, these strategies support a situation-specific attribution of emotions. Attention focuses on the situation or on the other person. At the same time, this teaches children to learn to modify their feelings rather than to try and change their social situation. In the long-term, this could lead to this feeling being attributed less action relevance in future situations, or to it simply being ignored. Such a development would also be functional in terms of the demand not to disturb the harmony of one’s reference group. It simultaneously promotes the development of an interdependent self-construal.

The description of these two divergent developmental paths—toward an independent versus interdependent self-construal—is in line with the description by Greenfield et al. (2003) and extends this approach to the domain of emotional development. However, given the current state of research, we cannot generalize this pattern of regulation to other emotion qualities as well. We still do not know which emotion qualities it may apply to. In a collectivist context, not all negative emotions are considered undesirable: An interdependent self-construal promotes the significance of emotions triggered by empathy with the emotions of another person, because important other persons are also viewed as being a part of the self. Already on the nonverbal level of communication, these emotions ensure coordination with the motives of the group, thus retaining the group’s internal harmony without the need for any special negotiation based on explicit verbal communication (see Trommsdorff, 1997).

This leads to a culture-specific positive feedback effect between the type of interpersonal emotion regulation by mothers, which is also influenced in part by their own self-construal, and the emotional development of the child. This, in turn, should be accompanied by the development of a functionally adaptive self-construal. Because this feedback process occurs in specific individuals or dyads, it is still possible for development within these dyads to deviate to a greater or lesser extent from the cultural model (of either the self-construal or of the concept of emotions).

5.2.4. The Internalization of Expression Signs

We have distinguished three broad phases of ontogenetic development during childhood. By the end of the second phase, children are already able to satisfy their motives by themselves and coordinate them with their social environment. They have developed the ability to engage in intrapersonal action and emotion
regulation. They no longer just use speech and expression signs as a social appeal to others but also as an appeal to the self in order to regulate their own actions and emotions.

Section 4.4.1 showed that one major milestone in the subsequent third phase is the internalization of the psychological means of regulation (the expression and speech signs) that children use for intrapersonal regulation. Objective expression and speech signs that can be perceived by outsiders (from the observer perspective) become mental expression and speech signs that, in the extreme case, can still be perceived only by the children themselves (from the actor perspective). Real actions turn into an internal planning and rehearsing with mental images. A mental level emerges in which individuals act in an imaginary space, speak and communicate with themselves, think through potential scenarios, and also experience feelings that may be no longer (or only scarcely) observable in their expression and body reactions.

We postulated that such an internalization also occurs in the domain of expression signs, and we managed to confirm this in a number of empirical studies on both children and adults. For example, we showed that emotional expression weakens as a function of increasing age in situations in which intrapersonal regulation is dominant, such as when one is alone, even though both children and adults continue to report experiencing intensive feelings. We called this phenomenon the miniaturization of expression (see Holodynski, 1995, 1997, 2004; Holodynski & Upmann, 2003a). Our more far-reaching assumption was that expression signs do not just disappear, but become internalized and thereby raised to a mental level. This was supported by the self-reports of adults who felt clear expression sensations during emotion episodes, although the expressions they reported feeling could not be seen by observers (see Holodynski et al., 2001). Nonetheless, it has to be recalled that all these studies were carried out in Germany and hence in only one culture.

From a cross-cultural perspective, it would be interesting to know whether such an internalization of psychological means of regulation, particularly that of expression signs, is a universal phenomenon, or one that is tied to culture-specific conditions. The current state of analysis would suggest two conditions that may influence the extent of expression internalization.

The first involves how far members of a culture in any way need to engage in an intrapersonal regulation of actions and emotions, and thus, whether any opportunity for internalization emerges. The second concerns which display rules (Ekman, 1972) and feeling rules (Hochschild, 1990) are dominant within a culture. If, for example, it is considered desirable within a culture to appear as emotionally expressive as possible, then this cultural display rule might also generalize to solitary situations and perhaps counter any internalization of expression—just like the opposite display rule, namely, to appear as unexpressive as possible, might encourage internalization. Both conditions will be discussed briefly in the following.
CHAPTER 5

Intercultural differences in the extent of intrapersonal regulation. In the previous section (see 5.2.3), when comparing German and Japanese mother–child dyads, we ascertained that mothers in Japan demand an intrapersonal regulation from their children at a later age than mothers in Germany. This suggests that it might be worthwhile to analyze cultures in terms of differences in how strongly daily life is shaped by direct social interactions. How far does a culture in any way provide space for an individual to be able (and perhaps also need) to be completely alone and thereby first gain the opportunity to build up a private sphere of thoughts, action, and emotions?

If persons spend their daily lives almost exclusively in direct social interactions, then almost all the emotions they experience will contain a direct interpersonal dimension. As a result, how they express their emotions, how they regulate them, and which actions they perform as a result of them will always remain socially coregulated. This is because these reactions are perceived and interpreted by their interaction partners who themselves, in turn, react with their own emotions and actions that the former must, or should, take into account. In such cases, intrapersonal regulation remain interwoven.

However, if, in contrast, a culture provides a variety of opportunities—and perhaps also needs—for members to be alone by themselves (see Eggers, 1985), individuals will have to cope with a number of emotion episodes without other persons reacting to them directly. As a consequence, the expression signs they display will lose their social appeal character, thus creating the necessary preconditions for what we called an internalization of expression signs in Section 3.1.4: The expression signs no longer have any externally directed communication function; they serve exclusively for self-communication. In such a cultural environment, inter- and intrapersonal forms of regulation can become distinct separate entities, leading to a much stronger internalization of expression signs.

It could be anticipated that daily life in collectivist cultures involves far more direct social interactions than that in individualistic cultures. However, highly industrialized collectivist cultures like Japan should also give adults a variety of experiences of having to regulate emotions by themselves in solitary situations.

Up to now, no cross-cultural studies have examined the development of expression within intrapersonal regulation in either adults or children from individualistic versus collectivist societies. The few studies that can be interpreted in light of our internalization hypothesis have been carried out exclusively in western cultures. These experimental studies have examined only the phenomenon of expression miniaturization in greater detail. They have analyzed how far adults in solitary situations display a weaker emotional expression than in comparable social situations with good friends to whom they generally display authentic emotions. These are the studies by Fridlund (1991) in the United States, Hess et al. (1995) in Switzerland, Holodynski (1997) in Germany, and the studies by Jakobs et al. (1999) as well as Jakobs et al. (2001) in the Netherlands. All apart from Jakobs
et al. (2001) produced a consistent pattern of findings showing that emotional expression was weaker in solitary compared with social situations. This indicates that the miniaturization of expression postulated in the internalization model may also be found in other western cultures.

Nonetheless, it has to be noted that Fridlund (1991), Hess et al. (1995), and Jakobs et al. (1999) studied only one emotion: amusement. Participants watched amusing film clips, and the intensity of their expression was measured. Further studies on other emotions are lacking. There are also still no cross-cultural studies of expression internalization; that is, how far persons from different cultures feel expression sensations in an emotion episode that cannot be seen by others.

Cultural display rules on emotional expressiveness. Up to now, we have interpreted the phenomenon of expression miniaturization in solitary situations as an effect of increasing intrapersonal regulation: Intensive emotion expression becomes redundant, so it is dropped in the interests of action economy. What we still do not know is how far those display rules for emotional expressiveness that are dominant in a particular culture also contribute to eliciting this type of expression miniaturization.

A diary study by Holodynski (1997; see also Section 4.5.1) showed that German men and women preferred to weaken or even neutralize their expression in many emotion episodes, whereas they only infrequently amplified or masked it. One might conclude that the expression control strategies of weakening and neutralizing are so habitualized that they generalize to solitary situations. Expression would remain unweakened in situations only in which a display of feelings is expressly desired. For example, Manstead (1991) argues that “residual forms of the display rules would become internalized by adulthood, so that they would operate even when the person is alone.” (p. 295).

How can we rule out the possibility that miniaturization of expression in solitary situations is only the effect of a generalization of cultural display rules? A cross-cultural study could help here by comparing expressive behavior of persons from cultures that differ in terms of their emotional expressiveness. Our German participants clearly belong to a less expressive culture, as indicated by the high percentage of control strategies for weakening or neutralizing expression. Therefore, we would have to compare them with members of a culture that accepts the display of feelings or even positively evaluates the control strategy of amplifying expression. If the miniaturization effect in solitary situations were to occur in the same way in an expressive culture as in the German sample, this would be an indication that it cannot be explained within the framework of cultural display rules on emotional expressiveness.

Scherer et al. (1986) performed a cross-cultural study showing that Spaniards and Italians were more expressive than Scandinavians or Germans. They asked persons from several European countries to recall an emotion episode of joy, sadness, fear, and anger and report on, among others, the intensity of their feeling
and their expression reactions. Wallbott, Ricci-Bitti, and Bänninger-Huber (1986) showed that Spanish participants reported more expressive reactions than German participants. When joyful, they more frequently displayed a happy facial expression, jumped and danced around; when fearful, they cried out more; and when angry, displayed an angry facial expression or hand emblems like clenched fist. These intercultural differences between Spaniards and Germans could therefore reflect differences in the cultural display rules on emotional expressiveness.

A further aspect is revealed in a study of cultural stereotypes by Pennebaker, Rimé, and Blankenship (1996). They gave a questionnaire to 2,600 persons from 26 countries (including Spain and Germany) in order to examine whether the inhabitants of the south of each single country were described as being more emotionally expressive than those from the north (in the northern hemisphere!). Results confirmed this stereotype: Persons from the south of a country rated themselves as being more expressive than their northern compatriots. They also obtained this result in their Spanish sample.

Cross-cultural study on the miniaturization of expression. The available research on cultural differences in expressiveness shows that Spain can be classified as a more expressive culture. Hence, our idea was to take a Spanish sample as a comparison group for the German sample, carry out the same diary study with them, and then compare findings in the two groups. We formulated the following hypotheses:

1. Spaniards will be more expressive than Germans.
2. The miniaturization effect in solitary situations will also be discernable in the daily emotion episodes of Spaniards.

Confirmation of both hypotheses would be a further indication that the miniaturization effect in solitary situations is not due to normative display rules or cultural expression habits, but to the emergence of intrapersonal regulation as postulated in the internalization model.

Participants were 42 Spanish women aged 19–28 years (M = 21.83, SD = 1.72) from Seville in southern Spain (Gendolla Morillo, 1997; Gendolla Morillo & Holodynski, 1997). The comparison group was the female participants in the German diary study reported in Section 4.5.1. These German women were aged 22–44 years (M = 26.49, SD = 4.46) and came from the northern German city of Bielefeld. All participants used a standardized diary to document every feeling they experienced in terms of its intensity and duration; the intensity of their expression (on a 10-point scale ranging from nothing [0] to very strong [9]) as well as its duration; their expression control (expression not controlled, neutralized, weakened, amplified, or masked, i.e., displaying an expression not corresponding to the feeling); and the situational context (solitary, in contact with others, alone among
TABLE 5.3. Number of Emotion Episodes and Both Feeling Intensity and Expression Intensity as a Function of Context and Culture

<table>
<thead>
<tr>
<th></th>
<th>In contact</th>
<th></th>
<th>Solitary</th>
<th></th>
<th>Alone among strangers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G</td>
<td>S</td>
<td>p</td>
<td>G</td>
<td>S</td>
<td>p</td>
</tr>
<tr>
<td>Emotion episodes Per hour</td>
<td>2.05</td>
<td>1.22 *</td>
<td>0.94</td>
<td>0.84 ns</td>
<td>1.19</td>
<td>0.74 **</td>
</tr>
<tr>
<td>Expression intensity M</td>
<td>4.03</td>
<td>4.80 ***</td>
<td>3.26</td>
<td>3.23 ns</td>
<td>2.84</td>
<td>3.30 ns</td>
</tr>
<tr>
<td>SD</td>
<td>0.95</td>
<td>1.06</td>
<td>1.31</td>
<td>1.72</td>
<td>1.26</td>
<td>1.44</td>
</tr>
<tr>
<td>Feeling intensity M</td>
<td>5.25</td>
<td>5.76 *</td>
<td>5.06</td>
<td>5.42 ns</td>
<td>5.05</td>
<td>5.54 *</td>
</tr>
<tr>
<td>SD</td>
<td>0.96</td>
<td>0.95</td>
<td>1.01</td>
<td>1.08</td>
<td>0.99</td>
<td>1.09</td>
</tr>
<tr>
<td>Percentage of emotion episodes with expression control M</td>
<td>52.63</td>
<td>59.26 ns</td>
<td>16.91</td>
<td>53.55 ***</td>
<td>57.80</td>
<td>62.91 ns</td>
</tr>
<tr>
<td>SD</td>
<td>22.99</td>
<td>26.13</td>
<td>21.79</td>
<td>33.26</td>
<td>24.23</td>
<td>30.74</td>
</tr>
</tbody>
</table>

*G = Germans, S = Spaniards. Expression and feeling scale from 0 (nothing) to 9 (extremely strong). Analyses based on mean intensities per person. *p < .05. **p < .01. ***p < .001.

strangers). They had to complete this diary throughout the day from getting up to going to bed for 4 days within a 1-week period.

Results on the culture specificity of expression and feeling. Each of the following analyses was based on a 2 × 3 MANOVAs with culture as between-subjects variable and context as within-subject variable. All computations were based on the individual means of the single participants within each condition.

Over the 4 days, the Germans documented more emotion episodes than the Spaniards (M = 77.68, SD = 41.87 vs. M = 62.00, SD = 41.66). When the number of emotion episodes was standardized to take differences in the number of hours documented per day into account, the culture effect remained (see below). The number of episodes documented per 4-hour interval ranged from 1 to 16. The number of episodes revealed a trend for the interaction effect between culture and context, $F(1.24, 94.23) = 3.52, p = .055$: Germans felt significantly more emotions than Spaniards in both the contact-with-others and the alone-among-strangers situations. In solitary situations, in contrast, no differences could be found (see Table 5.3). In addition, there was a significant context effect, $F(1.24, 94.23) = 17.67, p < .001$, indicating that most emotions were felt in contact-with-others situations; and there was a significant culture effect, $F(1, 76) = 7.43, p = .008$, which, nonetheless, was due essentially to the disordinal interaction effect.

*Participants had to self-rate their emotional expression. In Section 4.5.1, we have shown that such self-ratings are sufficiently reliable compared with external ratings of videographed expression (see also Barr & Kleck, 1995).
The hypothesis that Spanish women would be more emotionally expressive than German women could be confirmed. The $2 \times 3$ MANOVA for expression intensity revealed a significant interaction effect between culture and context, $F(1.78, 130.28) = 3.78, p = .030$: Spaniards showed a more intensive expression than Germans, particularly in contact with others, but not when they were in a solitary situation or alone among strangers (see Table 5.3). There was also a context effect, $F(11.78, 130.28) = 49.11, p < .001$, showing that expression was most intensive in contact-with-others situations, whereas it did not differ between the solitary and the alone-among-strangers situations.

The results revealed two main reasons for greater expressiveness among Spaniards:

1. Spaniards tended to report a stronger intensity of feeling than Germans, $F(1, 61) = 3.48, p = .067$, with significant cultural differences within the contact-with-others and the alone-among-strangers situations (see Table 5.3). The context effect was significant, $F(2, 122) = 6.30, p = .002$: Feeling intensity was stronger in the contact-with-others situations than in the two other situations that, in turn, did not differ from each other. There was no interaction effect. Entering feeling intensity as a covariate in a further analysis reduced these differences in expression intensity, but they did not disappear.

2. Moreover, an analysis of the percentage of expression-controlled emotion episodes revealed a disordinal interaction effect between culture and context, $F(2, 146) = 16.51, p < .001$. Germans exercised very little control over their expression in solitary situations, whereas Spaniards controlled it in one half of all their solitary situations—a comparable percentage to that in the other two situations (see Table 5.3).

In summary, the diary data study shows that the higher expressiveness of Spaniards is displayed particularly in contact-with-others situations, that is, when they are engaged in social interaction. Spaniards not only felt more intensive feelings than Germans but also controlled their expression more frequently—especially showing a greater use of the strategy of amplifying expression. This confirms the stereotype of the expressive Spaniard. At the same time, it can be seen that this is culturally staged: The stronger expressiveness does not seem to be a general phenomenon; it occurs exclusively in public in contact with other persons and not when one is alone.

Results on the miniaturization of expression in solitary situations. The miniaturization hypothesis was tested by computing a $2 \times 2$ MANCOVA with culture as between-subjects variable, context as within-subjects variable, and feeling intensity as covariate. We compared only the solitary with the contact-with-others situations, and selected only those emotion episodes in which expression was not
controlled. Computations were once again based on the individual means of the single participants in each situation. Because not all participants had experienced uncontrolled emotion episodes, the sample size dropped to 33 Spanish and 35 German women.

There was a significant relation between the feeling intensity covariate and expression intensity, $F(1, 65) = 71.42, p < .001$. There was no interaction effect between culture and context, $F(1, 65) = 1.27$, ns, and also no culture effect, $F(1, 65) = .86$, ns. However, there was a context effect in the expected direction, $F(1, 65) = 53.03, p < .001$: In uncontrolled emotion episodes, expression was weaker in solitary situations than in contact-with-others situations when feeling intensity was held constant (see Figure 5.4).

Hence, for adults, a miniaturization of expression in solitary situations can also be observed in an expressive culture. Therefore, this cannot be traced back to a generalization of cultural display rules to solitary situations. Instead, it seems to be the outcome of an increasing action economy in intrapersonal regulation, as postulated in the internalization model.

![FIGURE 5.4. Averaged intensity of expression and feeling during emotion episodes without expression control as a function of context and culture. Intensity scale from 0 (nothing) to 9 (extremely strong). $n = 33$ Spanish and $n = 35$ German women.](image-url)
5.3. SUMMARY AND OUTLOOK

The idea behind this culture chapter has been to gather some preliminary evidence on how far the internalization model’s premises on the development of emotions and emotion regulation are universal or only hold for western cultures. Our central questions for cross-cultural developmental psychology are whether culture-specific emotion qualities actually are built up during the course of development, or whether universal emotion qualities emerge that vary “only” in terms of minor differences in their frequency, intensity, or cause, and in the clarity of the subjective feeling. When searching for empirical answers to these questions, we found some encouraging cross-cultural support for our hypotheses, but there are still very many gaps. Hence, we were only able to make a few first moves toward testing the model assumptions on emotional development cross-culturally (including our own studies).

What future research is needed to gain a consistent picture of universal and culture-specific aspects in the development of emotions?

Our work on the internalization model of emotional development has provided a theoretical framework that defines the universal components of an emotion independently from any ethnotheories regarding the phenomenon of “emotion” that may be present in a specific culture. This framework views an emotion as a dynamic psychological system within an individual’s activity regulation composed of four components: appraisal, expression, body regulation, and feeling. This is in line with other functionalist definitions of emotion like that of Scherer (2001) or Frijda (1986). In more precise terms, an emotion is viewed as a self-organizing psychological system that appraises the significance of internal or external, context-related causes for one’s own motive satisfaction and triggers adaptive expression and body reactions. These are perceived through body feedback as a subjective feeling and related to the cause of the emotion so that motive-serving actions are (or can be) triggered either by the individual or by his or her interaction partner (see Section 3.1).

Furthermore, the internalization model depicts the set of (culturally) adaptive emotion qualities that an adult possesses for regulating his or her actions in a sociocultural context as a product of ontogenetic development, and it describes how this process functions. In the interactions between child and adult, the few precursor emotions available to the neonate are transformed into that large range of emotion qualities in the self-regulating adult that may reveal a greater or slighter culture specificity. Within this process, the ethnotheories in different cultures reflect cultural models for how to shape the interactions in which the caregiver initially performs regulation and motive satisfaction on the child’s behalf. This reveals that these interactions are the location at which developmental processes obtain their culture specificity.

The internalization model offers a theoretical framework providing universal categories that first make it possible to study which emotion components are to
which degree accessible to the influence of social interaction (and thereby finally to cultural norms as well), and which mechanisms are responsible for putting a cultural gloss on emotions. Such a developmental theory with a generalizable system of concepts provides the necessary basis for working out both universal and culture-specific aspects of emotional development.

In this overview, we want to sketch which aspects require further specification by asking which empirical studies would help us to further clarify these issues.

**Phases of emotional development.** To show how differentiated intrapersonal emotion systems emerge from precursor emotions during the course of ontogenesis, the internalization model separates emotional development into five major phases. This chapter focuses on only the first three phases, because the fourth phase (adolescence) has not yet been conceptualized in our model, and the fifth phase relates to emotional functioning in adults. These first three phases are:

1. The emergence of sign-mediated emotion systems
2. The emergence of intrapersonal emotional action regulation
3. The internalization of expression signs

Each of these three phases is defined through specific developmental tasks for the child, and through specific mechanisms that advance emotional development within the child–caregiver interaction process.

**Cross-cultural studies on the ontogenetic starting point of development.** Research on the emotional reactions of neonates has shown repeatedly that they can respond consistently to five distinguishable classes of causes with five different patterns of expression (see Izard & Malatesta, 1987; Sroufe, 1996). This indicates that human beings already possess five emotions at birth: distress, interest, endogenous pleasure, fright, and disgust. These five emotions seem to represent the biological starting point of postnatal emotional development. Nonetheless, it has to be stressed that these findings were gathered in western cultures. Although, up to now, there has been no reason to doubt that these five emotion patterns are universal for all neonates, this still needs to be confirmed cross-culturally.

Cross-cultural studies are also needed to clarify whether and how far there are cultural differences in how very young infants express individual temperament factors. These also belong to the basis of emotional development and may also decisively influence the subsequent form of interaction processes (see Section 5.2.1).

**Cross-cultural studies on the emergence of sign-mediated emotions in babies and infants.** During the first phase of development in babyhood and infancy, children have to tackle two developmental tasks: First, they have to take the precursor emotions sketched above and build up a differentiated repertoire of emotions mediated by expression signs within the framework of interpersonal regulation with caregivers. Second, they have to acquire a repertoire of coping actions with which they can satisfy their motives by themselves. Although these developmental tasks
seem to be universal, the interpersonal regulation of childhood emotions by caregivers introduces a great breadth of variation that seems to relate very closely to culture-specific ethnotheories.

Cross-cultural studies are needed to explain not only how far the actual child-rearing behavior of caregivers differs, but also how far this is accompanied by differences in childhood emotions and their regulation.

1. **Degree of proactive regulation.** Can caregivers from different cultures be distinguished in terms of how far they in any way expose their children to emotion-triggering situations and how far they already avoid these proactively by using antecedent strategies? Our own studies (see Friedlmeier, 2003, 2005a; Friedlmeier & Trommsdorff, 1999; Trommsdorff, 1995; Trommsdorff & Friedlmeier, 1999; see Section 5.2.3) have disclosed clear differences between individualistic and collectivist cultures. However, we still do not know what effects these have. For example, how far does a proactive regulation of emotions by caregivers delay, impede, or facilitate the transition to an intrapersonal regulation by the child? Or is such proactive regulation completely irrelevant here?

2. **Perception and interpretation of expression signs.** Precursor emotions become fully functioning, motive-serving emotions only after caregivers appropriately interpret the still unfocused childhood expression and body reactions, mirror them with their own exaggerated expression signs, and react promptly with motive-serving actions. Accordingly, the childhood emotion process is initially shared between child and caregiver; together they act as a coregulated system.

   This would make it interesting to find out which expression signs caregivers from different cultures perceive in their children and how they interpret them. For example, one major difference is whether caregivers carry their infants next to their bodies in slings for most of the day, or whether infants spend a lot of time lying in their own cots or engaging in face-to-face interactions. In the former case, **tactile** and auditory expression signs must be crucial; in the latter, more **visual** and auditory ones. In light of these different cultural practices, it seems unlikely that emotions communicate themselves exclusively through facial expression. This would limit communication to the visual channel, and would have to disadvantage children in body slings. Such a cross-cultural analysis of expression signs might uncover potentially universal and culture-specific perceptions and interpretations and thus provide indications on universal and culture-specific emotions (see below).

3. **Affect mirroring.** How far do caregivers from different cultures mirror the expression signs of their children? Does this practice depend on the meaning assigned to feeling components and intrapersonal regulation in
a culture? Although the internalization model would suggest such a relation, corresponding cross-cultural studies are lacking. First support comes from Friedlmeier and Trommsdorff (1999; see Section 5.2.3). At least in western cultures, affect mirroring seems to be a common way for sensitive caregivers to handle childhood emotions. Gottman (1997) even raises this to the rank of an important childrearing strategy that US-American parents can use to encourage emotional competence in their children and, in particular, to help them to become aware of their own feelings.

4. Preferred regulation strategies. Do the strategies that caregivers from varying cultures apply to regulate childhood emotion differ, and do such differences lead to a culture-specific formation of single emotion qualities? There are empirical indications that the highly confrontational emotion qualities of anger and defiance are less strong in collectivist cultures compared with individualistic ones (see Section 5.1.3).

We expect that major cultural differences in universal emotions or even emotions that can be classified as clearly culture-specific will form only in later phases of development.

Cross-cultural studies on the emergence of intrapersonal regulation in early childhood. In the second phase of development during the course of early childhood, children have to face a new task that we shall present as two aspects:

1. Performing motive-serving actions autonomously. Mastering this developmental task calls for a change in the interaction between caregiver and child. Caregivers reduce those actions they perform on their children’s behalf that the children are able to perform by themselves. Instead, they now demand and encourage the children to take over for themselves those actions they have acquired during interpersonal regulation. The child’s emotional expression should no longer be directed as an appeal to the caregiver. Children should now understand their emotion as an appeal to the self to initiate the necessary actions alone and thus apply the emotion for their own intrapersonal regulation.

   This aspect reveals clear cultural differences in both the age at which and the extent to which such autonomy is demanded in children. In collectivist cultures in which individuals are, in principle, engaged continuously in direct social interactions, all emotions are finally coregulated. The pressure to become autonomous is not as strong as in individualistic cultures.

2. Coordinating motive satisfaction with the social environment. A further aspect during the acquisition of intrapersonal action regulation is for children to learn that they cannot always satisfy their present motive immediately, but that they have to coordinate it with their social environment. They have to form the ability to modify the intensity and quality of the emotions oriented toward satisfying their current motive. Only then do they
become able to postpone the satisfaction of a motive or even to drop it completely. Infants whose actions are still guided almost exclusively by their emotions become children who, as they grow older, increasingly understand the need to no longer just give way to their emotions but also to regulate them in order to satisfy a higher level motive. The self emerges as an integrative system of activity regulation with a more or less successful coordination of the emotional and the reflective levels of regulation (see Section 3.4).

To help children to master this developmental task, caregivers increasingly reduce their vicarious emotion regulation. They encourage their children to take the strategies for modifying the intensity or the quality of their emotions they have acquired up to now in interpersonal regulation and start to apply them for themselves.

Empirical studies are needed to explain which regulation strategies caregivers from different cultures apply when interacting with their children; whether relations can be found between the regulation strategies applied and the ethnotheories within a culture; and whether the application of regulation strategies by caregivers leads to their adoption by their children, and, in turn, to the emergence of new emotion qualities. For example, our own studies of Japanese and German girls aged 2–5 years revealed clear developmental differences in the regulation strategies applied by caregivers.

A further aspect of this developmental task of coordinating intrapersonal action regulation with the social environment is the child’s orientation toward the standards and values of the (cultural) community. An action regulation that is merely autonomous but does not comply with these standards lacks embedment within the social context. This embedment emerges during a child’s motivational and emotional development. When interacting with their child, caregivers set behavior standards that reflect cultural values and norms, and they help the child to form new motives directed toward maintaining these standards. These norm-oriented motives are also accompanied by the emergence of the new emotions pride, shame, and guilt (Barrett, 1995; Holodynski, 1992; Stipek, 1995). During pride and shame episodes, infants experience that they can only successfully pursue their own individual motives when they take account of the social embedment of their actions. This leads to the emergence of the ability to see oneself through the eyes of esteemed others and to coordinate one’s own action with behavioral norms. Such norm-directed activity emerges through the emotions pride and shame signalizing the fulfillment or a threat to the self-ideal. It is not yet a product of voluntary decisions based on conscious insight into the legitimacy of a norm.
It can be assumed that the emotions pride and shame are also universal. Casimir and Schnegg (2002) studied 135 languages and dialects to see whether they possessed a term for one of the major body reactions of shame, namely, blushing. This was the case in 98 languages and dialects, strongly suggesting that the attendant emotion shame is universal. However, once again, there are probably differences in the age at which, the extent to which, and the reasons for which one should feel shame, as well as differences in how central these emotions are for the regulation of social relations. Whereas pride and shame are major regulators of social relations in cultures with a strong power distance, this is less the case in egalitarian societies. Hence, it is certainly relevant that German society reveals little acceptance for the use of shaming as a means to assert norm compliance in childrearing, whereas it is a central means in cultures with a strong focus on the concept of honor. However, once again, there is a lack of studies analyzing the development of these emotions.

The internalization of expression signs in intrapersonal regulation. In the third phase of development from approximately 6 years onward, the psychological means of regulation become internalized. This premise proceeds from the observation that adults do not disclose their emotions to external observers as much as children do. Whereas we can read off the emotions of younger children in their expression like a page in an open book, adults possess a private feeling sphere that cannot always be inferred from their expressive behavior.

However, how strongly adults are able to report and reflect on this private feeling sphere depends once again on how elaborate the emotion-related ethnotheories are, and how strongly individuals are aware of the symbol function of expression signs. This requires verbal communication over emotions—something that is emphasized more or less strongly in different cultures. For example, individualistic cultures place great value on internal feelings, whereas collectivist cultures focus more on the situational elements, that is, the cultural expectations related to the expression and which actions should be performed. It is also necessary to consider whether members of a culture go through their daily lives almost exclusively in direct social interactions, or whether they experience many situations in which they are alone and have to regulate their emotions and actions intrapersonally (see Section 5.2.4).

Conclusion. In all, we still do not know enough about how the single emotion qualities and emotion regulation actually develop in different cultures. Nonetheless, cross-cultural studies reveal that emotions and emotion regulation emerge and gain meaning as a part of social interactions, and that these social interactions in turn are embedded within broader familial, societal, and cultural contexts. It also has to be considered that emotions are increasingly associated with the self. Hence, the culture-specific self-construals also suggest that the development of the complete emotion system may follow different paths. In line with the internalization
model, it also becomes clear that the emergence of the different emotion qualities, as universal or culture-specific as they may be, is not shaped predominantly by verbal mediation processes, but requires nonverbal expression and actions within a social context.

It is to be anticipated that the cross-cultural study of emotions and their development will reveal both cross-cultural universalities and culture-specific differences. Through this, it will contribute to a better understanding of the processes and phenomena determined by socialization, and thus also help to produce more precise models of emotional development in general developmental psychology.
REFERENCES


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Janke, B. (2005b, April). “Red cheeks” and “jump in the air”: Are bodily sensations and action tendencies a component of children’s emotion knowledge? Poster, presented at the biennial meeting of the Society of Research in Child Development, Atlanta, GA.


REFERENCES


REFERENCES


REFERENCES


REFERENCES


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REFERENCES


White, S. (1996). The child’s entry into the “age of reason.” In A. J. Sameroff & M. M. Haith (Eds.), The five to seven year shift—The age of reason and responsibility (pp. 17–30). Chicago, IL: University of Chicago Press.


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