

Parental Ethnotheories, Social Practice and the Culture-Specific Development of Social Smiling in Infants

Joscha Kärtner, Manfred Holodynski, and Viktoriya Wörmann

University of Münster

In this article we argue that current theories on socioemotional development during infancy need to be reconceptualized in order to account for cross-cultural variation in caregiver–infant interaction. In line with the cultural-historical internalization theory of emotional development (Holodynski & Friedlmeier, 2006) and the ecocultural model of development (Keller & Kärtner, in press), we argue that socioemotional development can be understood only in the context of social practice and underlying ethnotheories that give significance to infants’ emotional expressions. Thus, culture-specific interpretations of and expectations concerning infants’ expressive cues lead to culture-specific interactional routines. These, in turn, lead to culture-specific usage of these expressions by the developing child. To develop our argument, we focus on a specific aspect of early socioemotional development, namely, the emergence of social smiling during infancy. Interactional dynamics in autonomous cultural milieus are based on specific ethnotheories, most prominently that positive emotional exchange during face-to-face interaction is one of the most desirable ways of interacting with infants. However, the dominant ethnotheories concerning emotional development and their associated behavioral routines vary systematically across cultural milieus and are markedly different in prototypically relational cultural milieus, in which they center on infants’ contentment. This has implications for infants’ emotional expressivity and, possibly, experience.

Drawing on theories of basic emotions (Ekman, 1992; Izard, 1977), early theories of socioemotional development during the infants’ first months often treated the development of social smiling as a further component of the two-month shift, which is—according to these theories—caused by maturational processes of the central nervous system (Emde & Buchsbaum, 1989; Wolff, 1987). However, more recent approaches have emphasized the important role that social interaction, mainly during mother–infant interaction, plays for early emotional development. These theories acknowledge the role of maturational processes but equally stress the role of social interaction, especially mother–infant interaction, based on biologically prepared behavioral predispositions of both the infant and the caregiver (Holodynski & Friedlmeier, 2006; Messinger & Fogel, 2007). This change has important theoretical implications in that it shifts, at least in part,

the causes and dynamics of emotional development from the intrapersonal to the interpersonal level.

According to the internalization model of emotional development (Holodynski & Friedlmeier, 2006), infants initially possess precursor emotions (e.g., endogenous pleasure) that need to be regulated interpersonally in order to become fully functioning emotion systems (e.g., joy; see also Holodynski, this issue). More specifically, before infants integrate the components of an emotion (i.e., appraisal, body reaction, expression, and feeling) and their contextual embedment (i.e., cause, coping action) into a fully functioning system, caregivers coregulate the infant's emotional behavior and experience. In this coregulatory process, the main developmental task during the first year of life is to refine the rudimentary and unfocused infant expressive and body reactions into a differentiated and contextually fine-tuned repertoire of expressions and their related emotions (Bennett, Bendersky, & Lewis, 2005; Malatesta & Haviland, 1982; Stenberg & Campos, 1990). In the case of social smiling, initially unfocused and fleeting smiles are transformed into full-blown expressions of pleasure. These smiles are characterized by prompt on- and offsets that are directed to the caregiver and accompanied by additional expressive features such as cooing and excited limb movements (Sroufe & Waters, 1976).

Both the infant and the mother are equipped with biologically prepared behavioral imitative inclinations that facilitate this differentiation of emotions through interpersonal regulation. Namely, infants are equipped with the capacity to mimic facial expressions (Heimann, 1998; Meltzoff & Moore, 1988). This ability also seems to be related to emotional cues such as smiling (Field, Woodson, Greenberg, & Cohen, 1982; Haviland & Lelwica, 1982; Kugiumutzakis, Kokkinaki, Makrodimitraki, & Vitalaki, 2005).

Caregivers, on the other side, monitor and imitate their infants' emotion-expressive behaviors, which has important developmental consequences. According to Gergely and Watson's (1999) social-biofeedback hypothesis, the repetitive presentation of an external reflection of the infant's rudimentary and unfocused affect-expressive displays serves a sensitizing function. As a result, the infant develops fine-tuned displays and, as a consequence, further differentiates internal cues that are indicative of different emotional states. In tandem, these two mechanisms—infant and maternal imitation—lead to the emergence of context-coordinated expression signs that are associated with specific emotions (Holodynski & Friedlmeier, 2006). Thus, the emergence and development of social smiling is not the consequence of biologically determined internal processes similar to fixed action patterns. Instead, it is the result of the dynamic interplay between the maturational processes associated with the two-month shift, which are integrated and selectively reinforced in mother–infant interaction (Lavelli & Fogel, 2002, 2005; Messinger & Fogel, 2007).

This assumption of interpersonal constitution of emotion episodes lies at the heart of the internalization model of emotional development. It has its roots in the cultural-historical tradition and follows Vygotsky's (1934/1987) ideas about symbolic mediation and the origin of higher psychological functions. According to Vygotsky's (1931/1997) *general psychological principle*, every higher psychological function starts as a social action—that is, as an interpersonal function—before it subsequently 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 action on others or a means of action of others on the individual. (Vygotsky, 1931/1997, p. 105) 75

Vygotsky’s general psychological principle can similarly be applied to the development of emotions and their expressions. In this sense, emotional development is a truly social process: It is only through interpersonal regulation that precursor emotions (in this case, endogenous pleasure) become fully functioning systems (i.e., joy of reunion or effect joy; see Holodynski, 2013). This assumption has major consequences for theoretical accounts of the development of emotions and expressive reactions. If emotions essentially possess an interpersonal regulation function early in ontogenesis then expressive reactions become the central mediators in the action regulation of young children. They achieve this through their semiotic function, namely, through their appealing function that conveys a message for the receiver to react in a particular way. As a consequence, this shifts the focus to meanings assigned to specific expression signs in a given culture. It furthermore shifts the focus to the degree to which caregivers in a specific cultural milieu interpret and respond to specific emotional expressions of their infants. If caregivers’ interpretations of and reactions to their infants’ emotional expressions differ in culture-specific ways, then the development of these expressions and their corresponding emotions should also be culture-specific. 80 85 90

CONTEXTUALIZING DEVELOPMENT: THE ECOCULTURAL MODEL

In addition to the internalization model of emotional development that explains how (culturally) different patterns of social interactions lead to different patterns of psychological functions, we draw on Keller and Kärtner’s (in press) ecocultural model of development that predicts specific cross-cultural variation in caregivers’ socialization goals, ethnotheories, and parenting behavior and their effects on child development. According to the ecocultural model of development, parenting behavior is composed of universal and biologically prepared behavioral inclinations that are designed to meet the infants’ basic needs and that are codesigned to complement infants’ behavioral repertoire. Of importance, the composition of and relative emphasis on these components depends on the cultural milieu and its affordances. In this sense, parenting styles and associated ethnotheories are culture specific and have evolved as adaptations to specific ecocultural environments (see also Greenfield, Keller, Fuligni, & Maynard, 2003; Keller, 2007; Whiting & Whiting, 1975). Key sociodemographic characteristics of these ecosocial contexts, including mothers’ age at first birth, formal education, family size, and family composition, have a correspondence on the psychological level that makes up the cultural aspects of the ecocultural model, which includes both ethnotheories and parenting behavior. This “cultural model” is defined as a specific and adaptive mindset that aligns universal and basic human needs (especially autonomy and relatedness) to the structure of the broader ecosocial context. As a consequence, specific ecosocial contexts lead to different manifestations of the cultural model, or cultural milieus, which are associated with specific socialization strategies and, finally, lead to culture-specific developmental pathways. 95 100 105 110

Regardless of the cultural context, people have a need for belongingness and relating to others, and they have a need for agency and having control over their life (Ryan & Deci, 2000). 115 Q2

According to Keller and Kärtner (in press), both these needs are equally important in all cultures yet may manifest differently depending on the cultural context. They strongly influence and coherently organize motivational tendencies, emotional experience, and behavioral inclinations throughout development. During ontogenetic development, caregivers emphasize different modes of autonomy and relatedness in a culture-specific way in that they differently sensitize children to specific elements of their social and nonsocial environment (e.g., others' expectations or inner experience). 120

In this article, we contrast two specific modes of autonomy and relatedness that are associated with two prototypically different cultural milieus and that have implications for caregivers' ethnotheories and behavioral routines concerning positive affectivity and smiling. 125

In highly educated Western, urban, middle-class families, human behavior and experience can best be characterized by *psychological autonomy* and *psychological relatedness*. *Psychological autonomy* centers on the exploration and reflective awareness of personal values, intentions, and desires. *Psychological relatedness* refers to an individualistic approach in which self-selected relations to others are defined and negotiated from the perspective of individual autonomy. In the following, this cultural milieu is referred to as the autonomous cultural milieu. 130

Within subsistence-based farming ecologies as another prototypical ecosocial contexts, human behavior and experience are framed by communal goals that are realized through behavioral obligations associated with specific social roles. This emphasis leads to the primacy of *action autonomy* and *hierarchical relatedness* and its manifestations in socialization goals, parenting ethnotheories, and behavior. Accordingly, infants are exposed to learning environments that are characterized by dense networks of social obligations and that emphasize children's action competence. *Action autonomy* is defined as the individual's self-regulated capacity to perform complex behavioral routines. In this sense, autonomy is manifested through self-regulated accomplishment of role-based obligations and responsibilities, whereas internal mental states play a subordinate role for human behavior and experience. In the following, this cultural milieu is referred to as the relational cultural milieu. 135 140

The approach of contrasting prototypically different cultural models does not, however, mean that all cultures and the associated cultural models could be categorized at either psychologically autonomous or relational. Rather, there are many other cultural models beyond these two cultural models that blend in different aspects of the prototypes to different degrees (so-called autonomous-relational cultural models) and there might be other prototypes, if one takes further dimensions (e.g., other basic human needs beyond autonomy and relatedness) into account (for a more detailed discussion, see Keller & Kärtner, in press). 145 150

Integrating both theoretical frameworks, the internalization model and the ecocultural model, we argue and review empirical evidence that supports the assumption that social smiling develops earlier in autonomous cultural milieus where caregivers' cultural models, that is, their socialization goals, behavior, and ethnotheories, support its early emergence. In the following, we first review empirical evidence for the interactional dynamics underlying the emergence of social smiling in prototypically autonomous cultural milieus. Then, we contrast these findings with studies from prototypically relational cultural milieus that strongly differ concerning their ethnotheories of infant smiling, parenting behavior, and developmental outcomes. 155

STUDIES ON THE INTERACTIVE DEVELOPMENT OF SMILING IN AUTONOMOUS CULTURAL MILIEUS: A UNIVERSAL BLUEPRINT? 160

Which are the key characteristics that contribute to the emergence of social smiling in autonomous cultural milieus? Lavelli and Fogel (2002, 2005) analyzed the dynamics of mother–infant face-to-face interaction during the first 14 weeks of life, especially how the relation between the infants’ attention to their caregivers’ faces and their emotional expression changed across the first three months and how these changes were related to caregivers’ behavior and vice versa. During the first month, Lavelli and Fogel found no relation between infants’ attention and emotion: Infants simply looked at their mothers’ faces, a behavior that was bidirectionally linked to caregivers’ talking and smiling. During the second and third month, infants’ attention to their mothers’ faces became increasingly emotional. Maternal expressions also changed, paralleling the developmental changes in the infant’s patterns of attention and emotion (Lavelli & Fogel, 2002, 2005). Maternal talking and smiling, infant smiling, and infant cooing were bidirectionally linked and cycled between each other, suggesting the existence of a positive emotional attractor in their social communication system. 165

This interpretation is further supported by a study of Messinger, Ruvolo, Ekas, and Fogel (2010) with a more direct empirical approach based on machine-learning methods, indicating that mothers smiled predictably in response to infant smiles from very early on, whereas infant smile initiations became more predictable over the first six months, leading, in consequence, to processes of mutual amplification and the establishment of turn taking around social smiling in early social communication. In sum, these studies suggest that social smiling develops gradually as infants and their caregivers coconstruct specific forms of social communication. 170

There are at least two features of caregivers’ communicative practices that bias the communicative system toward positive affectivity. First, maternal modeling primarily demonstrates positive emotions and signals (i.e., enjoyment and smiling) when interacting with their 3- to 6-month-old infants. Mothers restrict their own facial expressions to interest, enjoyment, surprise, and an eyebrow flash (Malatesta & Haviland, 1982). Second, not all emotions are mirrored equally by infants’ caregivers. Rather, mirroring occurs selectively, and caregivers show a strong tendency to mirror their infants’ expressions of interest, happiness, and surprise, and to a lesser degree, sadness or anger (Malatesta & Haviland, 1982). In a similar study, affect mirroring was highest for infants’ joy (Malatesta, Grigoryev, Lamb, Albin, & Culver, 1986). Finally, the high lability and fluctuation of infants’ emotional expressions gives caregivers multiple opportunities to respond to infant affect and, conceivably, to shape it. Due to their selective modeling and mirroring, caregivers’ positive affect (i.e., interest and happiness) at 3 months of age predicted infants’ positive emotional expressive behavior 2.5 months later (Malatesta et al., 1986). 185

To summarize, these findings suggest that the development of social smiling depends on the dynamic relationship between infants’ and caregivers’ communicative behavior. Caregivers’ socialization for positive emotionality is based on modeling, selective mirroring, positive feedback, and mutual amplification, and caregivers use a wide range of stimulating actions in multiple modalities that fuel the dynamic system just described and that contribute to the consolidation of emerging behavioral patterns around the exchange of positive affect. 195

The aforementioned findings concerning the dynamic relationship between infants’ and caregivers’ communicative behavior were all based on samples from “Western” cultures. Furthermore, there are many complimentary descriptive studies that report cross-cultural 200

variation in the onset of social smiling. For instance, Wolff (1963) found social smiling to occur before the end of the first month—long before the two-month shift—in a small sample of Boston Irish infants. He explained this finding by the high amount of stimulation that these seven infants received during caregiver–infant interaction. Anisfeld (1982) suggested a similar explanation for the unexpected result that infants from Sephardi backgrounds in Israel started to smile earlier than infants from Ashkenazi backgrounds. There are two further studies that reported differences in the development of smiling during the first 18 months of life among Israeli infants raised in four different sociocultural milieus, namely, kibbutz, Bedouin, middle-class families, and lower-class families (Gewirtz, 1965; Landau, 1977). Most importantly in this context, Landau found that Bedouin infants—presumably coming from a relational cultural milieu as previously introduced—smiled significantly less than infants in each of the other cultural contexts. Furthermore, Fogel, Toda, and Kawai (1988) could show that by 3 months, Euro-American infants smiled significantly more often and for a longer proportion of time than Japanese infants (a difference that seems to decline toward the end of the first year; see Camras et al., 1998; see also Caudill, 1973; Caudill & Weinstein, 1969). Obviously, there is empirical evidence of cultural variation in the onset as well as the frequency and intensity of social smiling during the infants’ first months of life. However, the authors of these studies mostly offered speculative explanations for sometimes unexpected differences between cultural milieus without providing empirical evidence for cross-cultural variation in caregivers’ ethnotheories concerning parenting behavior and the development of social smiling.

CULTURE-SPECIFIC ETHNOTHEORIES CONCERNING MOTHER–INFANT INTERACTION AND EMOTIONAL DEVELOPMENT

The aforementioned theories and studies take some assumptions for granted that seem questionable given cross-cultural research on early caregiver–infant interaction. Most important, these studies assume that there is a universal behavioral inclination or preference for positive emotional exchanges during face-to-face interaction (e.g., Lavelli & Fogel, 2002, 2005; Malatesta & Wilson, 1988; Messinger et al., 2010; Robson & Moss, 1970; Sroufe, 1996). However, based on Keller and Kärtner’s (in press) ecocultural model of development, we argue that parenting styles and associated ethnotheories are culture specific and have evolved as adaptations to specific ecocultural environments (Greenfield et al., 2003; Keller, 2007; Whiting & Whiting, 1975). According to this model, the dominant cultural model that is adaptive in a given ecocultural environment has far-reaching implications for its members’ self-construals, including their sense of themselves and themselves-in-relation-to-others. Emotional experience is an integral part of these cultural models that is elaborated upon in the following sections for the two prototypical cultural models, namely, autonomous and relational cultural milieus.

Dominant Ethnotheories in Autonomous Cultural Milieus

The dynamic dyadic processes that lead to extended periods of joyful interaction in mother–infant interaction are set into motion and consolidated by the specific type of parenting just described. One has to keep in mind, however, that caregivers try to elicit smiling from their infants and feel

rewarded by their infants' smiles because of a specific ethnotheoretical underpinning, namely, that the ideal way to engage infants is to have positive social exchanges during exclusive dyadic face-to-face interaction (see, e.g., Messinger et al.'s, 2010, dyadic smiling rules). This ideal of mother–infant interaction, however, is culture specific and has been described as prototypical for autonomous cultural milieus (Dixon, Tronick, Keefer, & Brazelton, 1981; Keller, 2007; LeVine et al., 1994). 245

Together with caregivers' mind-mindedness, that is, their inclination to explore their infants' communicative signals in terms of underlying preferences, emotions, desires, or intentions (Meins et al., 2002), and caregivers' sensitivity as another cornerstone of "optimal" parenting, this parenting style is functional in supporting the development of infants' sense of themselves as autonomous intentional agents that have a unique self with a specific configuration of internal attributes (e.g., traits, personal preferences, emotions, etc.) according to which they learn to behave (Kärtner & Keller, 2012; Kärtner, Keller, Chaudhary, & Yovsi, in press; Keller, 2007). 250 255 Q3

Concerning emotional experience, people in autonomous cultural milieus highlight and emphasize their individual feelings because such feelings are self-definitional (Markus & Kitayama, 1994). Knowing that one feels, what one feels, and that one can instrumentally control one's feelings is extremely important in autonomous cultural milieus (Wierzbicka, 1994). Especially smiling, positive self-feelings, and self-esteem are the basis of all positive emotions and function as an indicator of the adequacy and integrity of the self (Markus & Kitayama, 1994). 260

Dominant Ethnotheories in Relational Cultural Milieus

In the following, we are going to contrast this cultural model with a very different set of ethnotheories and social practices that is typical for relational cultural milieus. The data that we report come from families that have a very basic level of formal education, live in subsistence-based farming ecologies, and belong either to the ethnic group of the Gusii in the West of Kenya (LeVine et al., 1994) or the Nso in the North-Western grassfields in Cameroon (Keller, 2007). Caregivers in both these cultural milieus socialize their children toward obedience, respect for elders, cooperation, and social responsibility (LeVine et al., 1994; Nsamenang, 1992). Obligation between kin people is an integral and institutionalized part of morality and daily life (Goheen, 1996) and parents foster their children's integration into a hierarchically structured social setting (LeVine et al., 1994; Nsamenang & Lamb, 1994). 265 270

In these relational cultural milieus, the self is not strictly separated from others; it is the self-in-relation-to-others that is focal in individual experience (Keller, 2007; Shweder & Sullivan, 1993). As a consequence, emotions are experienced as intersubjective (vs. subjective internal) states and feelings of calmness, modesty, smoothness, and connectedness are regarded as positive and desirable (Markus & Kitayama, 1994). 275

Beginning from birth, caregivers' from the Nso and the Gusii cultural milieus have different goal states concerning emotion socialization than caregivers in autonomous cultural milieus, namely, the calm and modest child (Keller & Otto, 2009; LeVine et al., 1994). These findings are in line with many anthropological studies from other prototypically relational cultural milieus, that is, families with low levels of formal education living in rural subsistence-based ecologies, that came to similar conclusions, that is, the significance of calm contentment as the ideal state of an infant (e.g., Friedl, 1997, for a rural Iranian; Howrigan, 1988, for a Yucatán Mayan; or 280

Reichel-Dolmatoff, 1976, for a Columbian Kogi community). Building on these works, it is the central argument of this article that these cultural norms and values inform caregivers' social practices, which, in turn, should lead to different developmental trajectories and outcomes. 285

ALTERNATIVE PATTERNS OF EMOTION SOCIALIZATION: BRINGING OUT THE CALM CHILD

LeVine and colleagues (1994) described a pattern of emotion socialization among the Gusii that is very different from the autonomous cultural milieu. From different bodies of empirical evidence they conclude that Gusii mothers generally try to keep their babies calm, avoiding positive or negative arousal states by preventing or dampening excitement. Furthermore, Gusii mothers have a very specific way of coregulating their infants' positive excitement. In a study in which mother–infant face-to-face interactions were videotaped from postnatal Weeks 2 to 12, LeVine and colleagues described that 290

peaks in affective display produced a mixed response in mothers: Some giggled nervously; others turned away, their faces suddenly devoid of expression. The infants usually responded with milder but still positive displays. The sessions seemed flat and monotonous to the observer in the field, but microanalysis of the videotapes showed that the mothers' sudden gaze aversions were closely linked to the infants' peaks of affective display and as such were important junctures in the interactions. (p. 211) 300

In addition to these averting behaviors, Gusii mothers showed shorter sequences of play and talk as compared to Euro-American middle-class mothers. These shorter sequences did not allow time for affective arousal. Thus, Gusii interaction lacks the peaks of emotional excitement seen in Euro-American dyads (see also Dixon et al, 1981). 305

In their studies, LeVine and colleagues (1994) contrasted the Gusii model of parenting that they called the “pediatric” model with the “pedagogical” model of Bostonian middle-class families. LeVine and colleagues argued that both patterns are highly adaptive in the ecology that these families inhabit. Whereas the pediatric model—which corresponds to the relational cultural model—aims at protecting the infant for survival by calming distress, soothing and modulating excitement, the pedagogical model—which corresponds to the psychological autonomous cultural model—promotes active engagement and social exchange by responsiveness to cooing, stimulation, and elicitation of excitement. 310

Concerning the cultural context of the Nso, Keller and Otto (2009) described a pattern that is very similar to that of the Gusii. Based on individual and group interviews with Nso caregivers, Keller and Otto described the cultural norm concerning emotional expressivity during infancy as that of nonexpressivity: A well-developing child is emotionally neutral (see Lamm, 2008, for similar findings with sibling caretakers). As in LeVine and colleagues' pediatric model, the mothers' main role concerning their children's emotion regulation is that of preventing negative emotions from occurring, for example, by anticipatory breastfeeding. During interaction, mothers often use directives and prompts to suppress the display of negative emotionality (Demuth, 2008, p. 2013). Furthermore, Keller and Otto (2009) found that, concerning positive emotionality and infant smiling, German middle-class mothers and Nso mothers differ regarding the age at which they expect joy and smiling to develop in their infants. On average, Berlin mothers expected first 315 320 325

expression of joy around 2 months, whereas Nso mothers' expectation was, on average, at around 7 months of age (Keller & Otto, 2009).

To conclude, for Nso caregivers the ideal way to interact with an infant is to induce and maintain calm contentment. This clearly contrasts with the ideal of mother–infant interaction in autonomous cultural milieus, that is, positive social exchanges during exclusive dyadic face-to-face interaction. This should have important implications for the development of social smiling. 330

EMOTION SOCIALIZATION IN TWO PROTOTYPICAL CULTURAL MILIEUS: A CLOSE-UP OF GERMAN URBAN MIDDLE-CLASS AND RURAL NSO MOTHER–INFANT DYADS

In the following, we sketch an integrative picture for the contextual constitution of the development of social smiling and review empirical evidence for the other two components of the ecocultural model (i.e., parenting behavior and child development) that comes from rural Nso and German urban middle-class samples based on a longitudinal cross-cultural study of mother–infant interaction in postnatal weeks 4, 6, 8, 10, and 12 (Kärtner, Keller, & Yovsi, 2010; Wörmann, Holodynski, Kärtner, & Keller, 2012). We focus particularly on two dynamic aspects of mother–infant interaction that are critical for the emergence of social smiling, namely, maternal provision and infants' interest in face-to-face interaction and infant and maternal smiling and imitation. 335 340

Maternal Provision and Infants' Interest in Face-to-Face Interaction

The first study (Kärtner et al., 2010) took as a starting point the fact that all dynamic aspects of caregiver–infant interaction that were found to contribute to the development of infants' social smiling are characteristic of and do occur during face-to-face interaction (Lavelli & Fogel, 2002, 2005; Malatesta et al., 1986; Malatesta & Haviland, 1982; Messinger & Fogel, 2007). When asked to play with their infants as they would normally do, Nso mothers also engage in face-to-face interaction. However, Nso mothers do so less often than mothers from urban middle-class families in Germany. On average, Nso mothers established contexts that were favorable for face-to-face interaction between 37 and 56% of the interaction time in postnatal Weeks 4 to 12, whereas mothers from the urban German sample started at 75% in Week 4 and showed a linear increase up to 92% in Week 12 (Kärtner et al., 2010). Thus, face-to-face interaction does occur in caregiver–infant interaction in relational cultural milieus, but it does not play the same central role as in prototypically autonomous cultural milieus (see also Brazelton, 1977; Keller, 2007; LeVine et al., 1994; Whiting & Pope Edwards, 1988). Because social smiling emerges and develops during caregiver–infant face-to-face interaction, one critical question is how infants' gazing patterns develop if caregivers' ethnotheories and social practices regarding face-to-face interaction are different, as is the case in relational cultural milieus such as the rural Nso. 345 350 355

Concerning the developmental consequences of culture-specific emphases on face-to-face interaction, the study by Kärtner and colleagues (2010) could show that, for caregiver–infant dyads from an autonomous cultural milieu, there was an age-dependent increase in the percentage of time that the infants looked back at their mothers during episodes in which mothers established face-to-face context. As a consequence, the duration of mutual gaze, a factor influenced by 360

both the caregivers' provision of face-to-face context and the infants' interest, exhibits an abrupt increase between Weeks 4 and 6 (16% of interaction time in both weeks) and Weeks 8, 10, and 12 (between 34 and 39% of interaction time). This sharp increase in the duration of mutual gaze together with the sharp increase in alertness in the autonomous cultural milieu can be taken as evidence of the 2-month shift, as it is usually described in the literature (Lavelli & Fogel, 2002, 2005). 365

The pattern looked very different for the Nso infants. There, the 2-month shift took a different shape: Similar to the German infants from Münster, the Nso infants exhibited a sharp increase in awake alertness between Weeks 6 and 8. However, mothers' provision of face-to-face interaction as well as the Nso infants' interest in their mothers' faces (i.e., their gazing behavior) was significantly less pronounced and did not change with age (Kärtner et al., 2010). As a consequence, the duration of mutual gaze was continuous at a rather low level across postnatal Weeks 4 to 12 (between 6 and 10% of interaction time). 370 375

The observed cross-cultural differences in the duration of gazing at the mothers' faces cannot be attributed to either the infants or the mothers alone. Rather, culture-specific scripts and behavioral standards of the mothers may have interacted with emerging behavioral potentials. Thus, in cultural milieus that favor face-to-face communication, mothers may enthusiastically promote mutual gaze and face-to-face interaction with their infants. For example, the more the mother establishes face-to-face context, the more probable it is that the infant will engage in mutual gaze if he or she is looking at his or her mother. For mothers, in turn, these experiences are rewarding because of their ethnotheoretical underpinning that mutual gaze and face-to-face interaction is a desirable way of interacting with infants. If this ethnotheoretical underpinning is missing or different, as in the Nso sample, stable and continuous development seems to be the consequence. 380 385

Infant and Maternal Smiling and Imitation

In a further analysis, Wörmann and colleagues (2012) analyzed the same Münster and Nso caregiver–infant face-to-face interactions with a special emphasis on social smiling in postnatal Weeks 6 and 12. To our knowledge there is no other study that systematically compared the emergence and further development of social smiling in different sociocultural contexts while taking into account potentially underlying mechanisms, namely, infants' and caregivers' imitation of social smiling. 390

The results of this study show that mothers smiled significantly more at their infants while the infants were looking at them in the Münster than in the Nso sample, especially when infants were 12 weeks old (for details, see Wörmann et al., 2012). Correspondingly, infants from Münster smiled more at their caregivers while mothers were looking at them when they were 12 weeks old than when they were 6 weeks old, and they smiled more than the Nso infants at both ages. Furthermore, although only a minority of infants smiled at least once in the Nso sample at Weeks 6 and 12 and in the Münster sample in Week 6, the majority of 12-week-olds smiled at least once in the Münster sample. Finally, developmental changes in caregivers' imitation of infant smiling and infants' imitation of maternal smiling paralleled changes in maternal and, in particular, infant smiling. More specifically, both maternal and infant imitation was most pronounced in the Münster sample when infants were 12 weeks old. Thus, both maternal and infant imitation seem to contribute to the development of social smiling and might be critical mechanisms that underlie 400 405

the differential development in infant smiling in the two prototypically different cultural milieus. Thus, in addition to culture-specific differences in ethnotheories and social practices regarding face-to-face interaction and mutual gaze (Kärtner et al., 2010), there are differences in the dynamic organization of face-to-face interaction (Wörmann et al., 2012) that seem to influence the development of infant social smiling. 410

CONCLUSIONS AND OUTLOOK

Implications for Theories on Emotional Development and Beyond

The main idea developed in this article is that current approaches on the development of smiling need to be reconceptualized to include the cultural context in which development is embedded. Depending on caregivers' ethnotheories and social practices, an infants' development might follow very different developmental pathways. So far, most studies have focused on one of these routes, namely, that of joyful caregiver–infant interaction during face-to-face interaction, which leads to infants more actively initiating positive communicative exchanges. Caregivers support this development by modeling and selective mirroring of positive emotions (Malatesta et al., 1986; Malatesta & Haviland, 1982; Wörmann et al., 2012). Thus, positive feedback to infant smiling leads to mutual amplification processes through which episodes of joyful interaction emerge and consolidate (Lavelli & Fogel, 2002, 2005; Messinger et al., 2010). 415 420

In most of these studies, there is the implicit assumption that these dynamic processes are universal and “natural” because they are based on biologically prepared behavioral inclinations (e.g., maternal and infant imitation of smiling). We do agree that caregivers and infants are well prepared for interacting with each other and are equipped with a variety of behavioral inclinations. However, developmental processes are inextricably interwoven with caregivers' ethnotheories and social practices that shape the way in which these behavioral inclinations are implemented and used in social interaction (Greenfield et al., 2003; Keller, 2002). 425 430

If, as in the studies that were conducted in urban middle-class families from Western countries, the ideal of mother–infant interaction is that of joyful exchanges during exclusive face-to-face interaction, the behavioral inclination to mirror infants' behavioral expressions will be triggered more by positive emotion-expressive cues than by other emotional or nonemotional expressions. If, furthermore, positive emotionality is also the ideal for adults, there will be more modeling of positive emotions and a higher sensitivity for indicators of positive emotionality in the infant. 435

In autonomous cultural milieu, the first infant smiles during face-to-face interaction are an outstanding occurrence, which lead to intense feelings of love and attachment in caregivers. According to a study by Robson and Moss (1970), the infant is thereafter viewed as a person with unique characteristics who recognizes his mother as a specific individual. Thus, social smiling is taken as the starting point of a unique and exclusive relationship between a mother and her infant, which is another central ethnotheory in autonomous cultural milieu. 440

In relational cultural milieus, however, the meanings that are associated with infant smiling can be very different. According to the ethnotheories in the two cultural milieus that we have portrayed here, namely, the Gusii and the Nso, the ideal infant is emotionally neutral and feelings of calmness are regarded as positive and desirable. LeVine and colleagues (1994) argued that for the Gusii, smiling and laughing are taken as signs of overexcitement and a disruption of the 445

emotional equilibrium. Associated social practices are the counterregulation (i.e., preventing or dampening) of positive excitement in the Gusii.

In the case of the Nso, the findings that caregivers show relatively low degrees of smiling and affect mirroring and infants hardly smile in postnatal Week 12 (Wörmann et al., 2012), suggest two alternative readings. First, one could argue that, similar to the Gusii, social smiling can be interpreted as an undesirable sign of overexcitement that must be counterregulated if it occurs. However, studies so far have not focused on counterregulation during mother–infant interaction. Second, one could argue that, even if not undesirable, social smiling seems to be of little to no relevance in mother–infant interaction. The focus of caregivers’ attention is to establish and maintain nonnegative states in infants. In this specific context, the relevance of social smiling is restricted to the fact that it indicates the absence of negative states. This interpretation of social smiling as a tolerated but irrelevant state is in line with observations of others who lived in the rural Nso context for a considerable amount of time (B. Lamm & H. Otto, personal communication) that—from a normative autonomous perspective—although Nso mothers sometimes and rather accidentally do engage in joyful interaction, they terminate these episodes early.

Regardless of the interpretation chosen, the reviewed data clearly demonstrate that it is critically important that current theories of emotional development acknowledge that this development is situated in a semantic space, in which infants’ emotional expressions and experiences are mediated by the interpretations and reactions of their caregivers. As a consequence, the caregiver–infant interaction has a different dynamic that leads to different stable states in the dynamic system and to different developmental trajectories concerning infant smiling.

Thus, what Lavelli and Fogel (2002, 2005) described as a positive attractor in the dynamic system, namely, cycles of joyful quasi-dialogical interaction, is only one possible state in which the caregiver–infant communicative system might stabilize. In our opinion, the attractor state critically depends on culture-specific ethnotheories and social practices concerning emotionality and optimal parenting. In Gusii and Nso caregiver–infant interaction, the parenting practices described here may lead to an emotionally balanced neutral state in infants (LeVine et al., 1994; Wörmann et al., 2012). Thus, depending on what seems desirable in a given cultural milieu, caregivers selectively invest energy to fuel the dynamic system so that it stabilizes and consolidates in a desirable state.

The basic idea of the ecocultural model of development is that culture-specific patterns of socialization goals, ethnotheories, and parenting styles have evolved as adaptations to specific ecocultural contexts (Keller, 2007). These adaptations can be characterized by culture-specific self-construals that are based on specific conceptions of autonomy and relatedness and that provide structural continuity across ontogenetic development. In the case of emotional development, Keller and Kärtner’s theoretical approach can be fruitfully combined with Holodynski and Friedlmeier’s (2006; see also Holodynski, 2013) internalization model of emotional development that offers a theoretical framework that spells out specific mechanisms by which emotions develop as culture-sensitive and increasingly intrapersonally regulated functional systems.

In our opinion, the synthesized theoretical approach is very promising for mainly two reasons. First, it specifies different levels of cultural mediation, namely, socialization goals, ethnotheories, and parenting behavior that are hierarchically structured and influence infant and child development. Second, the model helps explaining culture-specific manifestations and developmental pathways for specific emotions. It assigns a mediational function to emotional expressions in caregiver–infant interactions as communicative signs that caregivers interpret and react to, based

on their culture-specific ethnotheories. Their reactions, in turn, modify infants' expressions and related emotions along these ethnotheories.

Implications for Conceptualizing the Development of Emotional Experience in Infancy 495

What implications do these findings have for the development of infants' emotional experience? Do Nso infants experience less pleasure because they smile less, or do they express the same emotions differently? We think that this is a difficult question that can only be addressed tentatively. First, some theories question whether early infant smiling indexes pleasure at all. According to Fogel and Thelen (1987), at the beginning, infant smiling has no function and is not associated with a specific motivational state. Rather, the function of smiling is acquired only through interpersonal regulation during the first year of life. Similarly, Holodynski and Friedlmeier (2006) argued that, at first, infant smiling is mainly imitation of maternal smiling and becomes an emotional expression sign through coregulatory processes within social interaction with caregivers. 500 Q5 505

Sroufe (1996), however, suggested that smiling is always about modulating tension, even if there are different qualities of smiling that are elicited by different cues in the course of development. According to his tension modulation hypothesis, stimulation increases the level of tension above some threshold, with the smile occurring as relaxation follows. Although this cycle is first set into motion by subcortically generated tension, it later marks the effortful assimilation of external stimulation. Thus, there is no clear evidence that smiling is a valid indicator of pleasure during the first weeks of life (see also Feldman Barrett, 2012). Reviewing neurophysiological studies, Messinger and Fogel (2007) concluded that although the neural origins of smiling are clear, there is no support for an affect program, as there is no consistent neural pathway for joy. 510

Second, Messinger and colleagues (Messinger & Fogel, 2007; Yale, Messinger, Cobo-Lewis, & Delgado, 2003) argued that, at least by 12 weeks, smiling occurs in interactive contexts associated with joy and is perceived as joyful. According to their approach, up to this age, joy as an intersubjective state emerges in interactive contexts that involve different types of maternal and infant smiling that are dynamically related. This seems to be an adequate description of the developmental processes that are typical of autonomous cultural milieus. Again, the critical question here is whether the interactive contexts would be similarly associated with joy and whether infants' smiling would be similarly perceived as joyful in relational cultural milieus. Future research should be directed at answering some of these more specific research questions. 515 520

Third, in our view it is important to differentiate pleasure from positive excitement. Being in a relaxed, calm, and emotionally neutral affective state and being positively excited can both be very pleasurable. However, these are different qualities of pleasure and, in our opinion, there are culture-specific preference in what seems desirable. Thus, we would not say that living in the relational cultural milieus portrayed here is less pleasurable but that the emotional quality may be different. Although calm contentment might be the ideal of pleasure in many relational cultural milieus, quasi-dialogical positive exchanges with more extreme tension-relaxation cycles leading to labile peaks of positive excitements might be the ideal in autonomous cultural milieus. Depending on the cultural frame of reference, the same behavior that is interpreted as a sign of pleasure in one culture can be interpreted as flat and monotonous in another, and the same 525 530

behavior that is interpreted as a sign of pleasure in one culture can be interpreted as hysteric and overexcited in another. 535

Implications for the Development of Infants' Self-Awareness

From a sociocultural perspective, ethnotheories and social practices around affect mirroring and infant smiling are an interesting phenomenon because they have important implications for the emergence and further development of infants' self-awareness. Mirroring infant smiles leads to an increasing awareness of subjective emotional states in infants. Thus, infants become subjectively aware of their inner psychological states in the sense of feelings organized by increasingly distinctive and conventionalized expression signs that are experienced as distinctive emotion states (Gergely & Watson, 1999; Holodynski & Friedlmeier, 2006, 2012). 540

Thus, culture-specific differences in mother's imitation of infant smiling lay the groundwork for differences in infants' self-awareness, which has implications for the further development of the self-concept in different cultural milieus. For instance, Kärtner and colleagues (in press) have shown that, during the second year, cultural contexts differ greatly regarding the age at which toddlers develop mirror self-recognition. More specifically, the ability to identify one's mirror image develops earlier in urban middle-class contexts that emphasize the development of autonomy as compared to relational cultural milieus. The authors of this study argue that mirror self-recognition reflects a specific representation, namely, the representation of the self as an autonomous intentional agent that is based on subjective self-awareness. Thus, not only do toddlers need to possess the ability for secondary representation but they also need a specific object or state to represent, in this case their own mental states (intentional and emotional). In this sense, it is not necessarily toddlers' general representational capacity that differs across cultures but toddlers' awareness of themselves, especially self-awareness of their internal states. 545 550 555

This specific type of self-awareness seems to be the result of social interaction, which enables toddlers to conceive of themselves as selves in the minds of others (Rochat & Zahavi, 2011). What seems to be critical in this regard is the degree to which caregivers direct their infants' attention to their own internal states. During the first months of life, this is primarily realized through caregivers' affect mirroring, which sensitizes toddlers to their intentional and emotional self-states, which they consequently become increasingly aware of. 560

Thus, culture-specific ethnotheories and social practices regarding infant smiling have substantial developmental consequences that go beyond culture-specific developmental trajectories of infant smiling in that they may constitute and lay the groundwork for infants' self-awareness and conception of the self. 565

REFERENCES

- Anisfeld, E. (1982). The onset of social smiling in preterm and full-term infants from two ethnic backgrounds. *Infant Behavior & Development*, 5, 387–395. 570
- Bennett, D. S., Bendersky, M., & Lewis, M. (2005). Does the organization of emotional expression change over time? Facial expressivity from 4 to 12 months. *Infancy*, 8, 167–187.
- Brazelton, T. B. (1977). Implications of infant development among the Mayan Indians of Mexico. In P. H. Leiderman, S. R. Tulkin, & A. Rosenfeld (Eds.), *Culture and infancy: Variations in the human experience* (pp. 151–188). New York: Academic Press. 575

- Camras, L. A., Oster, H., Campos, J., Campos, R., Ujiie, T., Miyake, K., et al. (1998). Production of emotional facial expressions in European American, Japanese, and Chinese infants. *Developmental Psychology, 34*, 616–628.
- Caudill, W. (1973). Psychiatry and Anthropology: The individual and his nexus. In L. Nader & T. W. Maretzki (Eds.), *Cultural illness and health: Essays in human adaptation* (Anthropological Studies 9, pp. 67–77). Arlington, VA: American Anthropological Association. 580
- Caudill, W., & Weinstein, H. (1969). Maternal care and infant behavior in Japan and America. *Psychiatry: Journal for the Study of Interpersonal Processes, 32*, 12–43.
- Demuth, C. (2008). *Talking to infants: How culture is instantiated in early mother–infant interactions. The case of Cameroonian farming Nso and North German middle-class families* (Unpublished doctoral thesis). University of Osnabrück, Osnabrück, Germany. 585
- Dixon, S., Tronick, E., Keefer, C., & Brazelton, T. B. (1981). Mother–infant interaction among the Gusii of Kenya. In T. M. Field, A. M. Sostek, P. Vietze, & P. H. Leiderman (Eds.), *Culture and early interaction* (pp. 149–170). Hillsdale, NJ: Erlbaum.
- Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6*, 169–200.
- Emde, R. N., & Buchsbaum, H. K. (1989). Toward a psychoanalytic theory of affect: II. Emotional development and signaling in infancy. In G. H. Pollock (Ed.), *The course of life, Vol. 1: Infancy* (pp. 193–227). Madison, CT: International Universities Press. 590
- Feldman Barrett, L. (2012). Emotions are real. *Emotion, 12*, 413–429.
- Field, T. M., Woodson, R., Greenberg, R., & Cohen, D. (1982). Discrimination and imitation of facial expressions by neonates. *Science, 218*, 179–181. 595
- Fogel, A., Toda, S., & Kawai, M. (1988). Mother–infant face-to-face interaction in Japan and the United States: A laboratory comparison using 3-month-old infants. *Developmental Psychology, 24*, 398–406.
- Friedl, E. (1997). *Children of Deh Koh: Young life in an Iranian village*. Syracuse, NY: Syracuse University Press.
- Gergely, G., & Watson, J. S. (1999). Early socio–emotional development: Contingency perception and the social-biofeedback model. In P. Rochat (Ed.), *Early social cognition: Understanding others in the first months of life* (pp. 101–136). Mahwah, NJ: Erlbaum. 600
- Gewirtz, J. L. (1965). The course of infant smiling in four children rearing environments in Israel. In B. M. Foss (Ed.), *Determinants of infant behavior* (Vol. 3, pp. 205–260). New York: Wiley.
- Goheen, M. (1996). *Men own the fields, women own the crops: Gender and power in the Cameroon grassfields*. Madison: University of Wisconsin Press. 605
- Greenfield, P. M., Keller, H., Fuligni, A., & Maynard, A. (2003). Cultural pathways through universal development. *Annual Review of Psychology, 54*, 461–490.
- Haviland, J. M., & Lelwica, M. (1987). The induced affect response: 10-week-old infants’ responses to three emotion expressions. *Developmental Psychology, 23*, 97–104.
- Heimann, M. (1998). Imitation in neonates, in older infants and in children with autism: Feedback to theory. In S. Bråten (Ed.), *Intersubjective communication and emotion in early ontogeny* (pp. 89–104). Cambridge, England: Cambridge University Press. 610 Q6
- Holodynski, M., & Friedlmeier, W. (2006). *Emotions—Development and regulation*. New York: Springer.
- Holodynski, M., & Friedlmeier, W. (2012). Affect and culture. In J. Valsiner (Ed.), *Oxford handbook of psychology and culture* (pp. 957–986). New York: Oxford University Press. 615
- Howrigan, G. (1988). Fertility, infant feeding, and change in Yucatán. *New Directions for Child and Adolescent Development, 40*, 37–50.
- Izard, C. E. (1977). *Human emotions*. New York: Plenum.
- Kärtner, J., Keller, H., Chaudhary, N., & Yovsi, R. (in press). The development of mirror self-recognition in different socio-cultural contexts. *Monographs of the Society for Research in Child Development*. 620
- Kärtner, J., Keller, H., & Yovsi, R. D. (2010). Mother–infant interaction during the first three months: The emergence of culture-specific contingency patterns. *Child Development, 81*, 540–554.
- Keller, H. (2002). Development as the interface between biology and culture: A conceptualization of early ontogenetic experiences. In H. Keller, Y. Poortinga, & A. Schoelmerich (Eds.), *Between culture and biology* (pp. 215–240). Cambridge, England: Cambridge University Press. 625
- Keller, H. (2007). *Cultures of infancy*. Mahwah, NJ: Erlbaum.
- Keller, H., & Kärtner, J. (in press). Development—The cultural solution of universal developmental tasks. In M. Gelfand, C. Chiu, & Y. Hong (Eds.), *Advances in culture and psychology* (Vol. 3). New York: Oxford University Press.

- Keller, H., & Otto, H. (2009). The cultural socialization of emotion regulation during infancy. *Journal of Cross-Cultural Psychology*, *40*, 996–1011. 630
- Kugiumutzakis, G., Kokkinaki, T., Makrodimitraki, M., & Vitalaki, E. (2005). Emotions in early mimesis. In J. Nadel & D. Muir (Eds.), *Emotional development* (pp.161–182). Oxford, UK: Oxford University Press.
- Lamm, B. (2008). *Children's ideas about infant care: A comparison of rural Nso children from Cameroon and German middle-class children* (Unpublished doctoral dissertation). University of Osnabrück, Osnabrück, Germany.
- Landau, R. (1977). Spontaneous and elicited smiles and vocalizations of infants in four Israeli environments. *Developmental Psychology*, *13*, 389–400. 635
- Lavelli, M., & Fogel, A. (2002). Developmental changes in mother–infant face-to-face communication: Birth to 3 months. *Developmental Psychology*, *38*, 288–305.
- Lavelli, M., & Fogel, A. (2005). Developmental changes in the relationship between the infant's attention and emotion during early face-to-face communication: The 2-month transition. *Developmental Psychology*, *41*, 265–280. 640
- LeVine, R. A., Dixon, S., LeVine, S., Richman, A., Leiderman, P. H., Keefer, C. H., et al. (1994). *Child care and culture: Lessons from Africa*. New York: Cambridge University Press.
- Malatesta, C. Z., Grigoryev, P., Lamb, C., Albin, M., & Culver, C. (1986). Emotion socialization and expressive development in preterm and full-term infants. *Child Development*, *57*, 316–330.
- Malatesta, C. Z., & Haviland, J. M. (1982). Learning display rules: The socialization of emotion expression in infancy. *Child Development*, *53*, 991–1003. 645
- Malatesta, C. Z., & Wilson, A. (1988). Emotion cognition interaction in personality development: A discrete emotions, functionalist analysis. *British Journal of Social Psychology*, *27*, 91–112.
- Markus, H. R., & Kitayama, S. (1994). The cultural construction of self and emotion. Implications for social behavior. In S. Kitayama & H. R. Markus (Eds.), *Emotion and culture: Empirical studies of mutual influence* (pp. 89–130). Washington, DC: American Psychological Association. 650
- Meins, E., Fernyhough, C., Wainwright, R., Das Gupta, M., Fradley, E., & Tuckey, M. (2002). Maternal mind-mindedness and attachment security as predictors of theory of mind understanding. *Child Development*, *73*, 1715–1726.
- Meltzoff, A. N., & Moore, M. K. (1988). The origins of imitation in infancy: Paradigm, phenomena, and theories. In C. Rovee-Collier & L. P. Lipsitt (Eds.), *Advances in infancy research* (pp. 265–301), Norwood, NJ: Ablex. 655
- Messinger, D., & Fogel, A. (2007). The interactive development of social smiling. In R. V. Kail (Ed.), *Advances in child development and behavior* (Vol. 35, pp. 327–366). San Diego, CA: Elsevier Academic.
- Messinger, D., Ruvolo, P., Ekas, N., & Fogel, A. (2010). Applying machine learning to infant interaction: The development is in the details. *Neural Networks*, *23*, 1004–1016.
- Nsamenang, A. B. (1992). *Human development in cultural context. A third world perspective*. Newbury Park, CA: Sage. 660
- Nsamenang, A. B., & Lamb, M. E. (1994). Socialization of Nso children in the Bamenda grassfields of Northwest Cameroon. In P. M. Greenfield & R. R. Cocking (Eds.), *Cross-cultural roots of minority child development* (pp. 133–146). Hillsdale, NJ: Erlbaum.
- Reichel-Dolmatoff, G. (1976). Training for the priesthood among the Kogi of Colombia. In J. Wilbert (Ed.), *Enculturation in Latin America* (pp. 265–288). Los Angeles: UCLA Latin American Center Publications. 665
- Robson, K. S., & Moss, H. A. (1970). Patterns and determinants of maternal attachment. *The Journal of Pediatrics*, *77*, 976–985.
- Rochat, P., & Zahavi, D. (2011). The uncanny mirror: A re-framing of mirror self-experience. *Cognition and Consciousness*, *20*, 204–213.
- Shweder, R. A. & Sullivan, M. (1993). Cultural psychology: Who needs it? *Annual Review of Psychology*, *44*, 497–523. 670
- Sroufe, L. A. (1996). *Emotional development: The organization of emotional life in the early years*. New York: Cambridge University Press.
- Sroufe, L. A., & Waters, E. (1976). The ontogenesis of smiling and laughter: A perspective on the organization of development in infancy. *Psychological Review*, *83*, 173–189.
- Stenberg, C. R., & Campos, J. J. (1990). The development of anger expressions in infancy. In N. L. Stein, B. Leventhal, & T. Trabasso (Eds.), *Psychological and biological approaches to emotion* (pp. 247–282). Hillsdale, NJ: Erlbaum. 675
- Thelen, E., Kelso, J., & Fogel, A. (1987). Self-organizing systems and infant motor development. *Developmental Review*, *7*, 39–65.
- Vygotsky, L. S. (1987). *The collected works of L. S. Vygotski. Vol. 1: Problems of general psychology* (R. W. Rieber & A. S. Carton, Eds.). New York: Plenum. (Original work published 1934) 680
- Vygotsky, L. S. (1997). *The collected works of L. S. Vygotsky, Vol. 4: The history of the development of higher mental functions* (R. W. Rieber, Ed.). New York: Plenum. (Original work published 1931)

- Whiting, B. B., & Pope Edwards, C. (1988). *Children of different worlds: The formation of social behavior*. Cambridge, MA: Harvard University Press.
- Whiting, B. B., & Whiting, J. W. M. (1975). *Children of six cultures: A psycho-cultural analysis*. Cambridge, MA: Harvard University Press. 685
- Wierzbicka, A. (1994). Emotion, language, and cultural scripts. In S. Kitayama & H. R. Markus (Eds.), *Emotion and culture: Empirical studies of mutual influence* (pp. 133–196). Washington, DC: American Psychological Association.
- Wolff, P. (1963). Observations of the early development of smiling. In B. M. Foss (Ed.), *Determinants of infant behavior* (pp. 113–138). London: Methuen. 690
- Wolff, P. H. (1987). *The development of behavioral states and the expression of emotions in early infancy: New proposals for investigation*. Chicago: University of Chicago Press.
- Wörmann, V., Holodynski, M., Kärtner, J., & Keller, H. (2012). A cross-cultural comparison of the development of the social smile. A longitudinal study of maternal and infant imitation in 6- and 12-week-old infants. *Infant Behavior and Development*, 35, 335–347. 695
- Yale, M. E., Messinger, D. S., Cobo-Lewis, A. B., & Delgado, C. F. (2003). The temporal coordination of early infant communication. *Developmental Psychology*, 39, 815–824.
- Yovsi, R., Kärtner, J., Keller, H., & Lohaus, A. (2009). Maternal interactional quality in two cultural environments. *Journal of Cross-Cultural Psychology*, 40, 701–707. Q8