Smiling

Introduction

Smiles are a prototypical facial expression of joy and positive emotion. A smile is formed when the zygomatic major muscle contracts and pulls the lip corners laterally upward. In addition to communicating happiness, smiles elicit positive engagement in others. This dynamic process of expressing and perceiving positive emotion contributes to the emergence of social competence in the developing child. This entry takes a lifespan approach, considering research on the development and role of smiling in infants, children, and adults.

Infancy

First smiles

Newborn infants tend to smile more frequently during drowsy and sleeping states, but smiles sometimes occur during non-sleep states during sensory stimulation. Over the first two months of life, infant smiling becomes increasingly linked to auditory and visual stimulation during non-sleep states—setting the stage for the emergence of social smiling.

Interactive smiles

Infant smiles create and maintain positively-toned social interactions with caregivers. Social smiling—smiling at the parent while gazing at the parent's face— develops during the second month of life. Infant's actively engage in interaction with the parent through social smiling. Between two and six months, infants increasingly respond to and initiate smiles with others. This

interactive smiling is linked to gazing at the parent's face and is often accompanied by vocalizations which express positive engagement.

Different types of smiles

Smiles are recognized as expressions of positive emotion. However, some smiles are more joyful than others. Smiles that involve eye constriction and the raising of the cheeks around the eyes—Duchenne smiles—are more likely to occur in circumstances that elicit positive emotion and are perceived as more emotionally positive than non-Duchenne smiles, which do not involve eye constriction. The same is true of smiles involving mouth opening. Smiles that combine both of these factors involve the strongest smiling action and may be the most emotionally positive (see **Figure 1**).

Figure 1. A 6-month-old infant displays a strong smile, evidenced by both the Duchenne marker (eye constriction) and mouth opening.

The form and timing of infant smiles change with development. In the first six months, smiles involving both eye constriction and mouth opening are increasingly likely to occur during highly joyful, social situations such as when the infant is gazing at the smiling mother. During the same period, infants begin to gaze away from the parent while smiling to regulate their own emotional arousal. In fact, overall, infants time their smile onsets and offsets in a fashion that maximizes the time when only the mother, and not the infant, is smiling. Between six and twelve months, smiles become increasingly likely to involve vocalizations such as laughter which convey emotional intensity. Infant smiles with laughter often occur during physical games like tickling

and visual games like peek-a-boo. As infants become more active agents in social games (e.g., moving the parent's hands in peek-a-boo), they become partners in producing their own positive expressions.

Smiles in referential communication

Between eight and twelve months, infants increasingly use smiles to referentially communicate enjoyment of objects and experiences to their social partners. Smiles begin to occur during coordinated joint attention in which the infant actively shifts attention between a toy and a social partner. Around eight months, infants begin to *initiate* joint attention by gazing between a toy and an adult and begin to integrate a smile into a gaze at an adult. One example is anticipatory smiling, in which an infant smiles at a toy and then turns to gaze at an adult, which may serve to communicate that the infant wants to share a humorous experience ("that's a funny toy").

Perception of smiles

Infants not only produce smiles, they perceive the smile of others. When infant smiles are influenced by the smiles of others, it suggests the infants' comprehension of the affective meaning of the smile. By four months, infants are able to discriminate between happy (smiling) faces and fearful expressions. Between twelve and eighteen months, comprehension of smiles during social referencing paradigms provides evidence for the development of social communication between infants and parents. In social referencing paradigms, infants are more likely to interpret an ambiguous stimulus as nonthreatening when an adult smiles. This suggests the infant interprets the adult's smile not as a direct expression of happiness, but as a referential signal.

Childhood

Toddler smiles

More is known about smiling in infancy than in childhood, as other components of social competence become more salient, and opportunities for close observation of the face become less frequent. However, smiling remains a critical element of play with parents as toddlers become more aware of the social meaning of smiles. Around two years, for example, smiling serves as a marker of pretense. Mothers smile more during pretense activities than during functional activities (e.g., pretending vs. really eating a snack). In response, toddlers participate and smile more during pretend activities when mothers smile more.

Smiles in preschoolers' peer play

By eighteen months, smiling is associated with interaction amongst peers, an increasingly important context for social development. Specific kinds of smiling become increasingly socially patterned with development. Between two and four years of age, Duchenne smiles and open-mouth smiles become increasingly used with same-sex peers. Boys use open-mouth smiles with male rather than female peers. These smiles may reflect developing social relationships, such as emerging sex segregation in young children. By four years, preschoolers exhibit stronger smiles, evidenced by mouth opening and eye constriction, during periods of social proximity and success.

Sociality of smiling in older children

As children age, social context exerts a continued influence on smiling. Preschoolers exhibit higher levels of Duchenne smiles when playing with an experimenter than when playing alone. By five years, children produce more Duchenne smiles when they succeed in games than when they fail. At six years, children evidence similar levels of smiling after receiving a prize when alone or when accompanied by an experimenter. By eight years, children show fewer strong smiles when alone than when with the experimenter, highlighting the role of sociality in the development of smile production.

Adulthood

Duchenne smiles

There is strong evidence for the sociality of smiles in adults. Duchenne smiles are robustly produced by interaction with others but are not always produced during feelings of intense joy. Nevertheless, adult Duchenne smiles are often perceived to be a spontaneous reflection of positive emotion, while non-Duchenne smiles are perceived to be a reflection of false or fake positive emotion. Observers attribute a multitude of positive characteristics to individuals displaying Duchenne smiles. They are perceived as more genuine, generous, and extroverted than individuals producing non-Duchenne smiles.

Deliberate Duchenne smiles

Although Duchenne smiles were initially thought to be spontaneous, a minority of individuals can deliberately produce a Duchenne smile even in the absence of positive emotion. Deliberate Duchenne smiles are perceived as more positive than non-Duchenne smiles. Individuals may use a deliberate Duchenne smile in interpersonal settings for utilitarian purposes such as disguising

their intentions. However, spontaneous Duchenne smiles are perceived as more positive than deliberate Duchenne smiles. This suggests the importance of temporal dynamics in naturalistic smile production. Spontaneous smiles, for example, involve a slower onset and offset than deliberate smiles.

Social bonding

The Duchenne smile is an important signal in the formation and maintenance of social groups. Duchenne smiles are displayed more during sharing tasks and may serve to advertise altruistic intentions. Mutual Duchenne smiling reflects the shared goals and positive affect of the group. Additionally, moderate alcohol consumption is linked to increases in mutual Duchenne smiles among group members. Smiles with mouth opening are facilitated by alcohol intake and may have similar social cohesion functions, but less is known about this type of smiling in adults.

Sex differences

Women smile and laugh more than men, but these sex differences are moderated by social norms. For example, the tendency of women to smile more than men is most evident when individuals believe they are being observed, suggesting the role of gender expectations in shaping smile production. Women are encouraged to be emotionally expressive and affiliative, and smiling serves this gender norm. By contrast, men are socialized to exhibit dominance, and reduced smiling serves this gender norm. Consequently, sex differences in smiling are less evident when individuals are constrained by other social norms. For example, service providers are encouraged to be friendly, while funeral directors must appear somber. Such situational constraints reduce sex differences in smiling between women and men.

Conclusion

Throughout the lifespan, smiles are a well-recognized facial signature of positive emotion. The form and timing of smiles changes rapidly early in life as infants become more active participants in positive social exchanges and in regulating their own emotions. In early childhood, smiling becomes an essential feature of developing peer play and relationships. By four years old, smiles reflect the social structure of peer interactions; by eight, smiles are expressed preferentially in the presence of another. In adulthood, smiling continues to index positive emotion but is strongly influenced by social context and roles.

Katherine B. Martin and Daniel S. Messinger

See also Infancy; Facial Expressions, Perception of; Social Development; Parent-Child Interactions; Emotion Expression; Happiness

Further Readings

Ruvolo, P., Messinger, D., & Movellan, J. (2015). Infants Time Their Smiles to Make Their Moms Smile. *PloS one*, *10*(9), e0136492.

Mattson, W. I., Cohn, J. F., Mahoor, M. H., Gangi, D. N., & Messinger, D. S. (2013). Darwin's Duchenne: Eye constriction during infant joy and distress. PLoS ONE, 8 (11). doi: 10.1371/journal.pone.0080161.

Krumhuber, E. G., & Manstead, A. S. (2009). Can Duchenne smiles be feigned? New evidence on felt and false smiles. *Emotion*, *9*(6), 807.

Hess, U., Adams Jr, R., & Kleck, R. (2005). Who may frown and who should smile? Dominance, affiliation, and the display of happiness and anger. *Cognition & Emotion*, *19*(4), 515-536.

Holodynski, M. (2004). The miniaturization of expression in the development of emotional self-regulation. *Developmental Psychology*, *40*(1), 16.

Ambadar, Z., Cohn, J. F., & Reed, L. I. (2009). All smiles are not created equal: Morphology and timing of smiles perceived as amused, polite, and embarrassed/nervous. *Journal of nonverbal behavior*, *33*(1), 17-34.