Published in final edited form as:

J Exp Child Psychol. 2015 August ; 136: 30–41. doi:10.1016/j.jecp.2015.03.012.

Laughing Matters: Infant Humor in the Context of Parental Affect

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Abstract

Smiling and laughing appear very early in the first year, but little is known about how infants come to appraise a stimulus as humorous. This short-term longitudinal study explored infant humor perception from 5- to 7-months as a function of parental affect during an absurd event. Using a within-subjects design, parents alternated smiling/laughing with emotional neutrality while acting absurdly toward their infants. Group comparisons showed that infants ($N = 37$) at all ages smiled at the event regardless of parental affect, but significantly longer at 5 and 6 months, and more often and sooner at 7 months when parents provided humor cues. Similarly, sequential analyses revealed that after gazing at the event, 7-month-olds were only more likely to smile at it when parents provided humor cues, and were comparatively more likely to look away when parents were neutral. Thus, starting at 5 months, parental affect influenced infants' affect toward an absurd event, an effect that was magnified at 7 months. These results are discussed in the context of emotional contagion, regulation, and the emergence of social referencing.

Keywords

Infant humor; smiling; laughter; emotional development; social referencing

Infants smile and laugh early in the first half of the first year of life (Wolff, 1963), long before they speak toward the end of the first year (Harris, 2004), but little is known about how or why they come to perceive events as humorous. Our research has been exploring infant humor perception as it emerges in the social-emotional context of their interactions with parents. Several lines of research have shown that in the first year, infants are sensitive to parental affect like maternal depression (Tronick, 1989) and fear (Sorce, Emde, Campos, & Klinnert, 1985), but very few studies have examined whether similar processes are at work in humor perception (Mireault, Crockenberg, Sparrow, Pettinato, Woodard & Malzac,

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2014). This study investigated whether young infants detect absurdity independently or are influenced by parental affective cues to perceive an absurd event as amusing.

Although smiling and laughter are not exclusive to humor perception, they are the best behavioral metric available to researchers studying humor, which generally refers to the perception or creation of amusement (Davies, 1998). Humor is a surprisingly serious topic with a wide range of developmental implications. Humor involves fairly complex cognitive processes (Rothbart, 1973), in particular the ability to recognize and resolve incongruity (Loizou, 2005; Sroufe & Wunsch, 1972; Veale, 2004). For example, in the second half of the first year, infants will laugh at the incongruous use of familiar objects, like putting a cloth in one's mouth (Sroufe & Wunsch, 1972) or putting a book on one's head (Mireault et al, 2014), suggesting that despite limited life experience, they have expectations for how such objects are typically used. Reddy (1991) observed infants as young as 8 months use humorous teasing, like offering and then withdrawing an object to a parent, or engaging a caregiver by using "fake" laughter. These simple acts of deception when originating from the infant suggest the possibility of an early, at least rudimentary, component of theory of mind, one important implication of infant humor perception (Hoicka & Akhtar, 2011; Hoicka, Jutsum & Gattis, 2008).

Humor in young children can also serve as an indicator of atypical development (Reddy, 2008; Reddy, Williams, & Vaughan, 2002). For example, children with autism are more likely to exhibit "solitary laughter", meaning that they laugh when alone in response to stimuli that do not typically evoke laughter in others, rarely laugh in response to others' laughter unless attempting to echo the sound, and rarely attempt to intentionally make others laugh (Reddy et al., 2002). Since humor may promote qualities that are associated with relationship satisfaction among adults including shared pleasurable affect, emotional intimacy, trust and empathy, some research has suggested that infant humor may be related to attachment (Mireault, Sparrow, Poutre, Perdue, & Macke, 2012a).

Although not ignoring the role of learning principles in the development of humor, most humor researchers agree that humor perception is too complex a process to be explained by reinforcement. The competing theories of infant humor involve primarily cognitive processes (Rothbart, 1973), although Reddy (1991) has proposed that humor is fundamentally social. Reinforcement may have more of a role in humor creation than perception. For example, when infants create humor, initially unintentionally, parents' smiles and laughs serve as likely reinforcers (Mireault, Poutre, Sargent-Hier, Dias, Perdue, & Myrick, 2012b). However, infants continue to attempt novel humorous behaviors suggesting that reinforcement alone does not account for their actions.

Wolff's (1963) descriptive study documented the emergence of smiling and laughter in the first year and resulted in a developmental timetable starting with social smiling (5-9 weeks) and progressing to laughter in response to physical stimulation (3 months), social games (5 months), and visual events (7-9 months). Reddy (2001, 2008) added her observation that infants begin intentionally creating humor (9-11 months) using nonverbal, absurd behavior. Reddy (2001, 2008) reports that by 9 months of age, infants will attempt to make others laugh using odd faces (e.g., puckered face, squash head into neck), noises (e.g., shrieks,

squawks), absurd actions (e.g., patting mother on head, holding up smelly feet), profane or aggressive actions (e.g., showing belly button, knocking over others' constructions), mocking (e.g., imitating snoring), odd self-decoration (e.g., putting cup on head), or regressive behaviors (e.g., blowing food out of mouth). These nonverbal attempts at humor tend to have universal appeal and are similar to those employed by adult clowns, hence Reddy's (2001) use of the term, "clowning".

In a longitudinal investigation of 3- to 12-month-olds, Mireault et al. (2012b) found that when parents were directed to elicit laughter in their infants, they engaged in clowning nearly half the time, despite the strategy being unnecessary with the youngest age group, as 20% of their smiles resulted from simple contagion to parents' smiles. However, over time, infants were significantly more likely to laugh and smile in response to clowning so that by 6 months it was the best strategy for making them laugh, whereas simple contagion in response to parents' smiles was nearly non-existent (5%). Parental clowning tended to include dramatic acts of absurdity like making bizarre faces and noises, or manipulating the infant's limbs to make them flap wildly. This raised the question of why infants found this strange behavior amusing, instead of frightening or uninteresting. One simple answer is that parents paired those unusual behaviors with smiling and laughter 65% of the time, potentially cueing infants to their pleasure, not only visually with their faces but acoustically with their voices (Hoicka & Gattis, 2012). Importantly, infants were not soliciting affective information about their parents' peculiar behavior in the classic social referencing sense (Campos, 1983). However, as Walden (1993) has noted, parents provide emotional messages in ambiguous situations where the infant is unsure how to respond, and infants tend to match their affect as a result.

Considerable research has demonstrated that young infants are responsive to parental affect. For example, studies consistently show that maternal depression or negative affect is associated with more distress and less positive affect in infants (Bridgett, Laake, Gartstein, & Dorn, 2013; Cohn & Tronick, 1989; Tronick, 1989). Multiple studies also show that infants become distressed when their mothers emotionally disengage as in the classic "still face" paradigm (Mesman, van IJzendoorn, & Bakermans-Kranenburg, 2009). Even newborn infants show a visual bias towards faces (Umiltá, Simion, & Valenza, 1996) and will imitate facial expressions conveying affect, including smiling and surprise (Meltzoff & Moore, 1983, 1989). Therefore, parental affect may similarly influence infants' likelihood of finding an event humorous, which could in turn help to explain why infants, older children, and adults differ in their tendencies to engage in humor. In a follow-up experiment, Mireault et al. (2014) found that 6-month-olds paid close attention to unsolicited parental humor cues about an absurd event performed by an experimenter, which influenced infants to smile at parents; 6 months later the same conditions influenced infants to smile at the event. Therefore, at some point between 6- and 12-months, infants' appraisal of a third-party event as humorous seems to be influenced by parental affect.

But given that familiar others are among the first to perform absurd actions (e.g., clowning) to amuse infants, might these effects emerge earlier or be different when the absurd behavior is performed by a caregiver? For example, might the infant independently appraise the absurdity as humorous, and if not, then when might positive parental affect begin to

influence the infant's view of an absurd event has humorous? If we assume that the ambiguity of such absurd events is greater for younger infants, we would expect parental affect to influence younger infants more than older ones. On the other hand, if infants are more likely to use parent affect to inform their own affective reactions to ambiguity around 8 months of age, as prior research suggests (Campos, 1983), then older infants would be more influenced by differences in parental affect than younger ones. These questions are important for several reasons. First, it adds to what little is known about infant humor perception, particularly whether parental affect creates a context that infants use to interpret absurd events as amusing. Second, since absurd behavior like clowning is initially ambiguous to infants, this study may identify precursors to social referencing, a tool infants use in the second half of the first year when confronted with ambiguity.

The present study tested: 1) whether unsolicited parental affect influences infants' perception of an event as humorous; and 2) whether there are developmental differences in this effect from 5- to 7-months. Parents presented their infants with an absurd event coupled with both positive and neutral affect in a within-subjects, counterbalanced design that was repeated when infants were 5-, 6-, and 7-months old. We hypothesized that parental affect would influence infants' interpretation of the event as amusing or not. Specifically, we expected that parents' affect would supersede parents' absurd behavior in defining an absurd event as positive as indicated by more infant positive affect in the positive than neutral affect condition. We hypothesized further that this effect would differ as a function of infant age, although we were uncertain whether younger or older infants would be more influenced by parental affect.

Method

Participants

Fifty-three infant-parent dyads were recruited from northern New England. Six pairs were dropped from the study for various reasons (video camera malfunction, incorrect protocol, parent did not follow instructions), resulting in forty-seven dyads. Of these, longitudinal data were complete for 37 pairs (19 males, 18 females). Infants were full-term, half were first-borns, and most (95%) participated with their mothers who were on average 31.74 years old ($SD = 4.94$). Most participating parents were married (91.5%) and college-educated (72.3%), and had a median combined annual income of \$75,000. Infants were 5-months-old at the first data collection point.

Measures

Smiling/Laughing—Due to their tendency to co-occur, smiling and laughing were collapsed into a single category. Raw frequency and duration (in seconds) of infants' smiling/laughing towards the event/parent were recorded. Working in pairs, research assistants coded smiling/laughing via facial expression based on the Baby Facial Action Coding System (Oster, Hegley, & Nagel, 1992). Smiling and laughing were easily observed, and strong inter-rater reliability ($r = 0.95$) was achieved.

Latency to Smile/Laugh—Latency was defined as the length of time (in seconds) that elapsed prior to the infant smiling/laughing.

Gaze at event/parent—When infants did not display positive affect while looking at the event/parent, their behavior was coded as gazing at the event/parent. Both frequency and duration (in seconds) of gazing was coded with excellent reliability ($r = 1.00$).

Look away—When infants averted their gaze from the event/parent and were not affectively positive, the behavior was coded as “look away”. Look away was coded for frequency and duration (in seconds) and inter-rater reliability was strong ($r = .88$).

Cohen’s Kappa for the three categorical variables (smiling/laughing, gazing, and looking away) was very good ($K = 0.83$).

Procedure

This experiment was one of several carried out in infants’ homes in a short-term longitudinal investigation of humor perception at 5-, 6-, and 7-months of age, serving as a replication with younger infants of a study on the role of social referencing in infant humor development (Mireault et al., 2014). As part of that study, infants were exposed to two ordinary events (shown a ball, read a book) and two absurd events (ball worn as a clown nose and continuously poked, book worn like hat and continuously raised and lowered), in a within-subjects randomized design during which parental affect (neutral and positive) during the absurd events was experimentally manipulated. Thus there were six conditions: ordinary 1, ordinary 2, absurd-neutral 1, absurd-positive 1, absurd-neutral 2, absurd-positive 2. All events were performed for the parent by an experimenter who remained affectively neutral. The infant was thus in the role of observer. After completing this procedure, parents and infants participated in an additional experiment on “clowning” (Mireault et al., 2012b; Reddy 2001) that is being reported here.

This particular procedure consisted of an ambiguous-absurd event (parent blowing air raspberries toward the infant) in two counterbalanced conditions each lasting 30 seconds with 5 seconds separating each phase (during which the parent directed his/her attention toward the researcher). Raspberries were chosen as the event because the event tends to be easy and comfortable for parents to perform, particularly with and without associated affect, and there is precedent for their use in prior research (Sroufe & Wunsch, 1972; Wolff, 1963). In one condition, the parent displayed an emotionally neutral face and in the other, the parent was smiling and laughing following each raspberry, which were performed continuously. All parents followed the instructions for the procedure, so none were excluded from the analysis.

During the procedure, the parent directly faced the infant who was seated in a high chair approximately 18 inches away. Parents were instructed not to touch or speak to the infant while performing the behavior. The procedure was intentionally brief given the short attention span of young infants, and because it followed several other experimental procedures in which the participants were involved.

Results

Group Comparisons

Three 3×2 (age $\times$ condition) repeated measures ANOVAs were conducted on smiling/laughing frequency, smiling/laughing duration, and latency to smile/laugh. All three analyses tested for sphericity via Mauchly's test, and were found to not violate the assumption ($p > .05$); hence, no corrections were employed for interpreting the ANOVA. Paired-samples t -tests were used for post hoc comparisons, and the Holm-Bonferroni method (Holm, 1979) was used to maintain the Familywise error rate (see Table 1). Given that three of these significant comparisons were found to have significantly skewed difference score distributions and two of these same comparisons contained one extreme outlier each (Warner, 2008), nonparametric related-samples sign tests were employed in order to verify the results of the t -test comparisons. All t -test comparisons that were found to be significant with the Holm-Bonferroni method were also found to be significant ($p < .05$) using the follow-up sign tests that compared the median differences.

Infants smiles/laughed in both conditions at all ages. However, as predicted, there was a main effect for condition on smiling/laughing frequency, such that infants smiled/laughed more frequently when parents gave affective cues of humor ($M_{\text{cued}} = 1.52$, $SE_{\text{cued}} = 0.14$) than when parents remained affectively neutral ($M_{\text{neutral}} = 1.06$, $SE_{\text{neutral}} = 0.12$), $F(1, 36) = 11.47$, $p = .002$, partial $\eta^2 = .24$, although the age $\times$ condition interaction only approached significance ($F(2, 72) = 2.43$, $p = .10$, partial $\eta^2 = .06$; See Figure 1). Post hoc analysis of means showed that the overall effect of condition on smile/laugh frequency only reached significance at 7 months, although the direction of the effect was the same at every age (See Table 1.) It is important to note here that the small overall means may be due to the relatively low base rates of smiling and laughter in this brief experimental procedure as well as for such young infants, restricting the variability for analysis.

As predicted, a main effect of condition was also found for smiling/laughing duration whereby infants smiled/laughed on average 3 seconds longer when parents gave affective cues of humor ($M_{\text{cued}} = 6.58$, $SE_{\text{cued}} = 0.74$) than when parents were emotionally neutral ($M_{\text{neutral}} = 3.68$, $SE_{\text{neutral}} = 0.59$), $F(1, 36) = 21.39$, $p < .001$, partial $\eta^2 = .37$. Post hoc comparisons showed that this effect was significant at 5- and 6-months of age and approached significance at 7-months (see Table 1). No other effects were significant in this analysis.

We also tested whether infants took longer to smile/laugh when parents did not provide positive affective information (i.e., remained neutral). As predicted, there was a main effect of condition on latency to smile such that infants' smiled sooner on average by 5 seconds when parents gave affectively positive cues of humor ($M_{\text{cued}} = 12.61$, $SE_{\text{cued}} = 0.91$) than when parents were affectively neutral ($M_{\text{neutral}} = 17.42$, $SE_{\text{neutral}} = 1.20$), $F(1, 35) = 21.16$, $p < .001$, partial $\eta^2 = .38$. Post hoc analysis of means showed that this effect was significant at 7-months, approached significance at 5- months, and trended in the same direction at 6-months (see Table 1). No other effects were found to be significant.

Sequential Analysis

Since raspberries were performed continuously, it was not possible to code infants' behavior before and after raspberries. Instead, we employed sequential analyses (using GSEQ; Bakeman & Quera, 1995; 2011) to examine the extent to which infant affect (smiling/laughing) and behavior (look away) were contingent upon parental affect (smiling/laughing vs. neutral). If infants use parental affect to interpret an event as humorous, then a sequence of behaviors consistent with this effect should occur at higher than chance levels. Analyzing the sequence of behaviors can lend further support to the inference that parental affect influences infant affect/behavior if the latter directly follows the former.

GSEQ compares observed with expected frequencies of the specified sequences, allowing one to test whether hypothesized behaviors follow others. The computed frequencies are then tested using chi-square analysis to determine whether the observed patterns significantly deviate from the expected patterns (Nishida & Lillard, 2007). After the chi-square results were examined for significance, follow-up (post hoc) assessments were computed in the form of adjusted residuals analyses and odds-ratio (*OR*) comparisons (Bakeman & Quera, 2011), which indicate the direction and degree to which observed and expected frequencies differed using normalized Z scores.

Sequential analyses tested infants' likelihood of smiling immediately after gazing at the event, by condition. We expected infants would use parental affect to interpret absurdity as positive when cued by parents, so that the following sequence would be more likely to occur in the cued condition: 1) the infant gazes at the event/parent, the infant smiles/laughs at the event/parent. Consistent with the prediction that parental affect influences infant humor perception, we expected the following sequences to be more likely in the neutral condition: 1) the infant gazes at the event/parent, followed by infant looks away, and 2) the infant smiles/laughs at the event/parent, followed by infant gazes at event/parent or looks away.

Table 2 summarizes the chi-square analyses for those sequences. All chi-squares were significant ($df = 2$; $n = 36$; $p < .01$), suggesting associations for both sequences at all ages, for both conditions. Consequently, adjusted residuals (i.e., z-scores) were used to reveal individual patterns among the given and target events (Bakeman & Quera, 2011). Sequential analyses revealed that immediately after gazing at parents' absurd behavior (BGP), 5- and 6-month-olds were significantly more likely to either smile at the parent (BSP) or look away from the parent (LA), regardless of condition (i.e., parental positive or neutral affect; see Figure 2). However, by 7 months, after gazing at parents' absurd behavior, infants were more likely to smile (BSP) only in the cued condition ($OR = 3.64$, 95% CI [1.67, 7.93], $p < .05$), while the neutral condition produced significantly higher levels of looking away (LA) compared to the cued condition ($OR = 3.83$, 95% CI [1.86, 7.85], $p < .05$).

Discussion

Infant humor perception emerges early in the first year, despite the complex interaction of cognitive, behavioral, social, and emotional factors involved (Hill, 1996). Humor can reveal infants' detection of incongruity (Forabosco, 1992; Hoicka & Akhtar, 2011) and their possible understanding of simple deception (Reddy, 1991), and has implications for some of

the major social-emotional milestones of infancy including attachment (Mireault et al., 2012a), social referencing (Mireault et al., 2012b; Mireault et al., 2014), and self-regulation (Walden, 1993). Yet very little is known about how infants come to perceive an event as amusing. For example, do infants make such appraisals independently, are they influenced by the affective cues of others, is some combination of both involved, and are there developmental differences in these effects?

The present study examined whether 5-, 6-, and 7-month-old infants perceive an absurd event as humorous independently or as a function of parental affect. In other words, did the raspberry matter? Several of our findings suggest it did, but that when embedded in a humorous emotional context it became significantly more amusing. Specifically, infants at all ages smiled and laughed at the absurd event regardless of parental affect, suggesting that infants were not simply matching their affect to their parents. However, infants at all ages were influenced by parental humor cues as indicated by main effects for condition on frequency and duration of smiling and laughing and latency to smile, and by post hoc analysis. Specifically, at 5 and 6 months, infants smiled and laughed at their parents' absurd behavior even when parents were neutral, but smiled significantly longer when cued by parental affect. By 7 months, infants smiled and laughed more often and sooner when their parents cued them than when they remained neutral. Thus generally speaking, the social-emotional context in which the humorous event was embedded was important to infants' appraisal of the event as positive, if not amusing. This finding is consistent with Reddy's (1991) proposal that humor perception arises within the dynamic interpersonal context of infancy, which she describes as "an important part of the experience of interacting with babies in any extended and secure relationship" (p. 143).

Whether infants' smiling and laughter reflected humor perception or affect matching (Gergely & Watson, 1996) or contagion is not clear. In fact, affect-matching or contagion is a likely part of the interpersonal context that Reddy (1991) describes and is relevant to humor perception. Infants did laugh and smile at the absurd event when parents were neutral so their perception of humor is not entirely explained by affect-matching. However, they smiled and laughed significantly more often, longer, and sooner when parents provided humor cues, an effect that increased with age. Emotional contagion may be part of the process by which infants come to understand absurd events as amusing. Other researchers (Brown, Wheeler, & Cash, 1980; Chapman, 1973; Provine, 2004) have previously documented that the laughter of others is an essential part of humor perception for children and adults. Infants appear to be no exception. Future studies might further disentangle the role of absurdity and parental affect in infants' humor perception by presenting absurd events discretely, so that infant affect might be coded before and after the absurd event. In this study, raspberries were presented continuously preventing before- and-after affect coding.

The finding that the effect of parental affect on the frequency of infant smiling/laughter is greater among the oldest (7-month-old) infants and that this is due to less infant smiling and laughter in the neutral condition suggests a developmental effect of parental affect and infant age on infant emotion regulation and humor perception. The absence of parental affect is of particular consequence at 7-months of age, whereby parents' lack of affect appeared to

influence 7-month-olds to re-evaluate the event as *not* humorous. The sequential analysis further supports this finding by showing that after gazing at parents' absurd behavior in the neutral condition, only 7-month-olds were significantly less likely than chance to smile at the absurd event and significantly more likely to look away from the absurd event despite parents' absurd actions. Looking away is recognized as an early emotion regulation strategy employed by infants when confronted with emotional neutrality or negativity (Tronick, 1989), and this may explain the increased incidence of looking away in the neutral condition. Prior research has shown that infants employ such gaze aversion as early as 2 months of age (Hsu & Jeng, 2008), and do so to regulate negative and positive affect (Stifter & Moyer, 1991). The infants in our study, at 5- and 6-months, may have been less likely to look away from parental neutrality because it existed in the context of absurd behavior, which may have distracted infants from or buffered the effect of parental neutrality.

In addition, seven-month-olds are on the verge of acquiring social referencing in which they will seek affective information from parents under ambiguous conditions of potential threat (Campos, 1983). At 7-months, the infants in our study were particularly sensitive to parental neutrality, smiling and laughing less when parents were emotionally neutral, suggesting that infants used that information to re-evaluate the event as not amusing. This effect is essentially the same for children and adults whose humor perception is enhanced or suppressed when in the company of others who are laughing or not laughing, respectively (Chapman, 1973; Provine, 2004; Robbins & Vandree, 2009), and may point to a system of socially-sensitive smiling regulation that is present even in infants. It is important to keep in mind that because of the longitudinal design, it is possible that 7-month-olds' behavior reflects their experience with the procedure rather than a developmental effect. This seems unlikely given the brevity of the procedure and would be more plausible if they had found the absurd event equally unamusing across conditions.

Infants in this study did not have the opportunity to elicit parental affect and so could not be said to have engaged in social referencing. Nevertheless, the emotional information parents provided was influential in regulating infants' positive appraisal of an ambiguous-absurd event starting at 5-months, just one month (on average) after the onset of laughter in infancy (Sroufe & Wunsch, 1972). Given these results as well as the finding that parents provide explicit positive affective cues for infants when acting absurdly (Mireault et al., 2012b), we propose that infants' attention to parental affect and subsequent self-regulation is an early step in the development of social referencing that is apparent by 8 months (Mireault et al., 2014; Walden, 1993). This interpretation is especially supported by 7-month-olds' sensitivity to parental neutrality just one month prior to the emergence of social referencing, and is consistent with Mireault et al.'s (2014) observation of a developmental change from 6- to 12-months wherein younger infants smiled at parents smiling at an absurd event, whereas older infants smiled at the event after seeing a parent smile at it. Thus, infants' attention to parental affect during absurd events in early infancy may be a precursor in their use of social referencing during such events later on in infancy.

The current findings differ from classic still-face findings (Ekas, Haltigan, & Messinger, 2013) in that although parents in our study were affectively neutral, they were simultaneously behaving absurdly. The implication, as Reddy (1991) proposed, is that

humor perception is not an isolated cognitive experience that involves detecting and resolving incongruities, but is embedded in a rich social and emotional dynamic context. At all ages, infants appeared to be more influenced by parental affect than parental behavior, suggesting that the social-emotional context is key to early humor perception.

Future Directions

This study has several limitations including the brief procedure, limited range of dependent measures, and a small sample. In addition, the observed effect at 7 months may be an artifact of the longitudinal, repeated measures design providing them with multiple exposures to the event. Future research would benefit from additional behavioral measures (approach/withdrawal, reach, etc.) to corroborate the findings based on infant affect and look away behavior, as well as the influence of infant humor on parental interactions, which may in turn influence early humor development. Additionally, it would be useful to investigate whether 7-month-old infants actively solicit information from parents to interpret ambiguous-absurd events, engaging in social-referencing earlier than has heretofore been reported. Although smiling and laughter are universal in infancy, humor is largely impacted by culture (Davies, 1998). Future studies should examine whether cultural and/or gender effects on humor become evident in infancy, as this may have implications for other developmental processes that are subject to such effects.

Acknowledgements

The authors wish to thank Roger Bakeman, Ph.D. for his consultation on the sequential analyses applied to these data, and Elena Hoicka, Ph.D. for her excellent comments on an earlier draft. This research was funded by the Vermont Genetics Network project grant #2P20RR016462, via the National Institutes of Health INBRE 1 P20 RR16462.

Role of the Funding Source Please note that the Vermont Genetics Network had no role in the study design, nor in the collection, analysis and interpretation of data, the writing of the report, nor the decision to submit the article for publication.

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Highlights

- By 5 months of age, infants smile and laugh at the absurd behavior of others despite the absence of others' affective cues.
- The affective cues of others influence 5- to 7-month-old infants to find absurd events significantly more amusing.
- By 7 months, infants are particularly sensitive to the absence of others' affective cues, resulting in their appraisal of an absurd event as not amusing.

Figure 1.

The effects of age and cueing on mean smiling frequency, duration, and latency. Error bars represent ± 1 SEM.

Figure 2.

Adjusted residuals for the age and cueing conditions. BGP [barb2right] BSP / LA sequences; BSP = baby smiles at parent; LA = baby looks away; BGP = baby gazes at parent.

Table 1

Post Hoc Comparisons for All Three Age Groups

DV	Age Tested		
	5 months	6 months	7 months
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M(SD)</i>
Smile/Laugh Frequency			
<i>Cued</i>	1.37(1.26)	1.45(1.29)	1.67(1.24)
<i>Neutral</i>	1.02(1.33)	1.17(1.31)	0.80(0.98)
	$t(40) = 1.52,$	$t(41) = 1.36,$	$t(38) = 4.39,$
	$p = .137$	$p = .183$	$p = .001^*$
			$d = .70$
Smile/Laugh Duration			
<i>Cued</i>	6.85(7.37)	6.76(7.02)	6.72(6.49)
<i>Neutral</i>	3.66(5.25)	3.10(3.96)	3.80(5.85)
	$t(40) = 3.13,$	$t(41) = 3.69,$	$t(38) = 2.68,$
	$p = .003^*$	$p = .001^*$	$p = .011$
	$d = .49$	$d = .57$	$d = .43$
Latency to Smile/Laugh			
<i>Cued</i>	14.65(11.80)	12.33(10.93)	12.36(10.33)
<i>Neutral</i>	19.85(11.64)	15.71(11.36)	19.44(11.86)
	$t(39) = -2.64,$	$t(41) = -1.70,$	$t(38) = -3.45,$
	$p = .012$	$p = .100$	$p = .001^*$
	$d = .42$		$d = .55$

Note. The Holm-Bonferroni method for multiple comparisons was used to maintain the Familywise error rate of .05 across all comparisons. See Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics*, 6, 65-70. Significance values designated with * indicate statistically significant differences based on this procedure. Cohen's *d* effect sizes are provided for significant comparisons.

Table 2

Sequential Analysis of BSP and LA Events Following BGP at 5, 6, and 7 Months

Age / Event	Neutral				Cued			
	<i>O</i>	<i>E</i>	χ^2	<i>p</i>	<i>O</i>	<i>E</i>	χ^2	<i>p</i>
5 Months:								
BSP	32	14.51	94.61	< .01	40	19.04	97.35	< .01
LA	40	24.55			37	22.64		
6 Months:								
BSP	31	16.30	72.48	< .01	31	15.31	78.14	< .01
LA	35	20.46			31	17.37		
7 Months:								
BSP	12	9.47	74.74	< .01	33	17.46	63.96	< .01
LA	48	23.19			31	17.75		

Note. BSP = baby smiles at parent; LA = baby looks away; BGP = baby gazes at parent; *O* = observed frequencies; *E* = expected frequencies; χ^2 (df = 2; n = 36)