DOES HAVING SIBLINGS AFFECT CARETAKING RESPONSES TO INFANTS?

By

Kaitlin R Duskin

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Committee Membership

Dr. Amanda Hahn, Committee Chair

Dr. Amber Gaffney, Committee Member

Dr. Brandilynn Villarreal, Committee Member

Dr. Amber Gaffney, Program Graduate Coordinator

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Abstract

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Infant facial cues affect a variety of caretaking-related responses in adults. These effects have primarily been explored as they relate to parental care, however infants receive care from others who are not their parents and it would be important for any caregiver, regardless of parental status, to respond to infant cues effectively. Because siblings often fulfill a caregiver role in the home, this study investigated whether having siblings, younger siblings in particular, influences the way in which adults respond to infant cues. Contrary to my predictions, the findings in this study indicate that having siblings does not influence how rewarding infant cuteness is nor how sensitive participants are to infant cuteness. Additional analyses exploring the potential impact of experience with younger siblings also failed to show that responses to infant cues were sensitive to this type of alloparental care. Future research should consider investigating if the age difference between siblings affects responses to infant cues.

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Introduction

Human faces give us important information that facilitates social perceptions and subsequent interactions (Langlois et al., 1995). Certain faces preferentially grab our attention (e.g. Öhman et al., 2001; Ro et al., 2001; Vuilleumier, 2000), and infant faces, in particular, elicit preferential allocation of attention (e.g., Cárdenas et al., 2013; Thompson-Booth et al., 2014a; Venturoso et al., 2019). This preferential allocation of attention to infant-related stimuli is thought to serve an adaptive function – given their total reliance on adult care for survival, it is adaptive that humans are especially attuned to infants (Lorenz, 1943). The majority of research on this topic has focused on adult's responses to infant faces to analyze parental care, especially maternal care. However, parents are not the only ones to engage in caretaking responses. Cross-cultural studies suggest that although biological mothers are typically the greatest contributors to infant care (Kramer, 2005; Marlowe, 2005), fathers, siblings, and grandparents also invest in infant care (Geary, 2008; Marlowe, 2005). These alloparent caregivers may provide important contributions to infant development. The current study will explore responses to infant faces among individuals with and without siblings to further investigate potential sibling caretaking responses.

Responses to Infant Faces

Konrad Lorenz (1943) proposed the 'Kindchenschema' (or baby-schema), as an innate releasing mechanism triggered by baby-typical features, such as a large head, round face, big eyes, small nose, etc. These newborn/young cues elicit caretaking responses from adults across species. Consistent with this proposal, research shows that

baby-schema is perceived as cute (Borgi et al., 2014; Little, 2012), is rewarding (Glocker et al., 2009b; Hahn et al., 2013, 2015a, 2015b; Parsons et al., 2011), and enhances caretaking responses in adults (Glocker, et al., 2009a; Kurdahi Badr (Zahr) & Abdallah, 2001). Moreover, adults typically report being more likely to care for, protect, and form close bonds with infants that display facial cues that are perceived to be cute (Alley, 1981, Alley, 1983, Glocker et al., 2008, Hildebrandt & Fitzgerald, 1978). For example, in a study on the influence of cuteness on infant medical care, premature infants in the NICU that were rated as cuter by nurses, gained more weight, and spent less time in the hospital. These favorable outcomes occurred, presumably because the cute infants received more affectionate care than the less cute infants (Kurdahi Badr (Zahr) & Abdallah, 2001).

Infants that exhibit high levels of this baby-schema are perceived as cuter than those who do not (Borgi et al., 2014; Glocker et al., 2008). High baby-schema (or baby-schema) refers to infants with chubby cheeks, high forehead, large eyes, and small nose and mouth. There are multiple methods and approaches to studying the baby-schema. For example, an early study of the impact of baby-schema features, Alley (1981) asked participants to rank head shape line drawings from least to most cute and found that participants rated the drawings with high-infantile characteristics as cuter than drawings with low-infantile characteristics. This effect was significant in both the frontal and profile views of line drawings. These findings demonstrate the importance of high-infantile head shape on cuteness perception (Alley, 1981). More recently, studies have used advanced computer graphic techniques to study the impact of baby-schema on

cuteness perception (e.g., Glocker et al., 2009a, 2009b; Hahn et al., 2013, 2015a, 2015b; Little, 2012; Sprengelmeyer et al., 2009). Previous research using these techniques have held the infants' identity constant (i.e. used the same infant) to account for individual differences while producing high and low versions of the baby-schema. These manipulations work by altering the shape, size, and distance of features commonly associated with infant cuteness. High baby-schema manipulations consist of a round face, high forehead, big eyes, and small nose and mouth. Low baby-schema manipulations include a narrow face, low forehead, small eyes, and big nose and mouth. For example, Glocker et. al., (2009a) found that high baby-schema infants were rated as cuter and earned higher caretaking motivation responses than the low or unmanipulated versions.

Cuteness influences important aspects of parental care behaviors in adults. For example, cuter infants are commonly treated in a more lenient manner compared to their less cute counterparts (Langlois et al., 1995; Alley, 1983). In a study investigating the behaviors and attitudes of mothers based on infants' appearance, results show that cuter infants were more likely to be engaged with affectionate behaviors by their mothers, while less cute infants were more likely to be engaged with more routine caregiving behaviors, devoid of this affectionate interaction (Langlois et al., 1995). In this study, mothers described less cute infants as interfering more in the parents' lives than did mothers of cuter infants. Mothers reported more negative attitudes towards their infants if their infants became less cute (according to a panel of undergraduate students) over the three-month observation period. These findings support the idea that cuteness may elicit more positive caretaking responses and suppress negative parenting responses. For

example, Alley (1983) found that adults (students) reported being more likely to protect or defend cute than non-cute infants (i.e., those with more baby-schema vs. less). Cuteness also seems to impact direct caretaking quality. Glocker and colleagues asked undergraduate students to rate how much they would like to take care of various infants using a Likert-type scale and found that people reported a stronger desire to take care of cuter babies than less cute babies. Volk and Quinsey (2002) explored this phenomenon using a hypothetical adoption paradigm, wherein participants reported their desire to adopt various infants. The authors found that participants reported a stronger desire to adopt cuter babies than less cute babies. Together, these findings highlight the impact that baby-schema has on both actual and theoretical caretaking behavior.

The baby-schema preference is so strong that it extends across species (Borgi et al., 2014; Sanefuji et al., 2007; Little 2012; Lehmann et al., 2013) and to inanimate objects (Hinde & Barden., 1985; Morris et al., 1995; Miesler et al., 2011). For instance, Miesler and colleagues (2011), found that participants who viewed cars (which researchers manipulated to exhibit baby schema characteristics) perceived the cars as cuter, and demonstrated greater, positive affective responses than those who viewed the unmanipulated cars.

Other artefacts such as teddy bears, including the well-known Mickey mouse character, have also evolved over the years to portray more of these baby-like features (Hind & Barden, 1985; Morris et al., 1995). Similar studies looking at this effect among different species found that adults and children prefer looking at dogs, cats (Borgi et al., 2014), chimpanzees, and rabbits (Sanefuji et al., 2007) that exhibit high baby schema

characteristics. Other techniques have been used to study the caretaking effects influenced by the baby-schema.

Studies using both neuroimaging and behavioral techniques provide evidence that the neurocognitive mechanism for these caretaking-relevant responses to baby-schema involves the brain's reward system (reviewed in Hahn & Perrett, 2014). Neuroimaging studies indicate that baby-schema activates brain areas commonly associated with the reward system, such as the nucleus accumbens, anterior cingulate cortex, and thalamo-cingulate circuit (Caria et al., 2012; Glocker et al., 2009b). For example, in an fMRI study, Glocker and colleagues (2009b) showed nulliparous women pictures of infants with high baby-schema and infants with low baby-schema (along with unmanipulated images) and found that increased baby-schema was associated with increased activity in the nucleus accumbens related to the anticipation of reward.

Similarly, Caria and colleagues (2012) found that infant faces elicited stronger activity in the thalamo-cingulate circuit than adult faces (infant faces have a higher degree of baby-schema than adult faces). This circuit is linked to interactive responses and attachment behaviors as well as caregiving behaviors in adults (Glocker et al., 2009b). Other studies using behavioral measures of reward suggest that using the keypress paradigm accurately assesses the reward value of certain stimuli. This paradigm works by recording the amount of effort subjects exert to change the viewing time for specific stimuli. For instance, Aharon et al. (2001) reported that participants exerted more effort (viewed photos longer) using the keypress task while viewing attractive faces and the corresponding fMRI results indicated higher activation in the brain's reward circuits.

Parental Status

Previous research implicates that being a parent can change the way individuals respond to infants. Studies using behavioral measures show that parental status affects responsiveness to baby faces (Thompson-Booth et al., 2014b, 2014a). For example, Thompson-Booth and colleagues (2014a, 2014b) showed that parents have enhanced attention allocation to infant faces compared to non-parents and that mothers spent more time looking at infant faces compared to non-mothers. Thompson-Booth (2013) provides evidence that individuals viewed infant faces for a longer amount of time versus other-aged faces, and this was particularly prominent in parents, which shows an enhanced preferential allocation to infant faces. Similar to Thompson-Booth and colleagues (2014a, 2014b) parents showed longer reaction times when viewing infant faces compared to non-parents, and this effect was even greater amongst parents who viewed infants with a negative emotional state which may be an important adaptation to help infants needs and promote caretaking. Attentional allocation was similar between mothers and fathers, suggesting that parenting experience may impact attentional allocation to infant faces, as opposed to a biological preparedness (Thompson-Booth, 2013).

Other studies employ neuroimaging techniques to investigate the effects of parental status on processing of infant faces (Noll et al., 2012; Proverbio et al., 2006; Piallini et al., 2003). Proverbio and colleagues (2012) found that mothers showed greater neural activity in the left hemisphere when viewing infants compared to nulliparous women. Similarly, Noll and colleagues (2012) found hemispheric asymmetries in responses to infants as a function of parental status using EEG techniques. Specifically,

they looked at the P1 for a general early visual processing neural marker and the N170 for an early face processing neural marker. Parental status did not have an impact on face processing generally, however, a significant interaction was found between parental status and hemisphere activity. The N170 is used as an early face processing neural marker and exhibited stronger activity in the right hemisphere versus the left hemisphere for non-mothers, while mothers showed more equal hemispheric sensitivity to infant faces, suggesting that non-parents have asymmetry in face perception (Noll et al., 2012).

Considering Alloparental Caregivers

Although much of the research on attention and caretaking has focused on parents, there are often other caretakers involved in raising children (i.e alloparents). In one such study, De Bruine and colleagues (2011) investigated the effects of having opposite-sex siblings on prosocial and sexual attitudes. Younger siblings have strong cues of kinship from maternal-perinatal association, whereas older siblings do not. In general, women exhibited a self-resemblance bias when determining women's and men's trustworthiness and women's attractiveness, but not for men's attractiveness. Women without brothers had a greater self-resemblance bias for attraction, but not for trustworthiness. The more brothers women had predicted stronger aversions to self-resemblance. Women without younger brothers showed a greater self-resemblance bias for male attraction than women with younger brothers. Attractiveness seems to be affected by the birth position and number of siblings, while trustworthiness judgments do not (DeBruine et al., 2011). These findings suggest that having siblings may influence perceptions of faces.

Similarly, Luo and colleagues (2015) found that experience with siblings affects the likeability of children's faces for adults. Participants were undergraduate college students with and without siblings who had no children of their own and no extensive experience with children other than their siblings. As researchers suspected, infant faces held the highest likeability ratings in both adults with and without siblings. When looking at faces ranging from infants to children 6.5 years of age, adult participants with siblings maintained their likeability for young children's faces (>7 months of age), while participants without siblings showed lower likeability ratings with increasing age. Participants with siblings found infants and children equally likeable while participants without siblings found children less likeable than infants. These findings suggest that the baby schema may be enhanced for adults who had experience with siblings during their childhood. Although there were no differences in likeability ratings if participants had older versus younger siblings, the closer in age participants were to their sibling the higher likeability ratings were (Luo et al., 2015).

The Current Study

The purpose of the current study is to investigate the reward value of infant cuteness and cuteness sensitivity in adults with siblings compared to adults without siblings by manipulating the baby schema effect (i.e., cuteness) in infant faces. My aim is to help bridge the gaps between previous research on how experience with children during developmental stages may shape adults' sensitivity to cuteness perception of infants' faces later in life.

Hypothesis 1

Given that individuals with siblings may have more experience with caretaking and infants, I predict that both the reward value of infant cuteness and cuteness sensitivity will be higher in individuals with siblings than those without.

Hypothesis 2

Given that individuals with younger siblings will likely have had more caretaking opportunities, I predict that these effects will be stronger in individuals with younger siblings than those without younger siblings.

Methods

Participants

A total of 72 participants (46 females, 23 males, 3 did not disclose) between the ages of 18-45 (*M* = 26.32 years, *SD* = 7.89) were recruited from Cal Poly Humboldt's SONA Systems (a participant management tool used in the Psychology department). This system allows undergraduate and graduate students to participate in various studies going on in the Psychology department. Among this sample, 40 participants reported that they had at least one younger sibling, 24 participants did not have younger siblings, and 8 participants had no siblings. The majority of participants were white (68.1%), followed by Latino (15.3%), mixed race/ethnicity (6.9%), other (5.6%), East Asian (5.6%), African (4.2%), Arabic (2.8%), and West Asian (1.4%).

Participants had the option of stopping the study at any time, therefore not everyone completed both tasks (described below) - 69 participants completed the rating task, and 55 participants completed the keypress task, 52 participants completed both tasks. The 3 participants who completed the keypress task but not the rating task all had younger siblings. The 17 participants who completed the rating task but not the keypress task were represented across all three sibling groups (3 had no siblings, 6 had no younger siblings, and 8 had younger siblings). The ages and ethnicities of these participants who completed one but not both tasks were varied (age range 18-45). Because the study was conducted fully online, the reason behind attrition is unknown. However, it is not surprising that more participants dropped out of the keypress task than the rating task

given that the keypress task is uncommon and involves additional training which participants may find boring.

Sibling Composition

Participants completed a sibling composition questionnaire that asked them to report the type (i.e., full, half, step/adopted), sex, and age of each of their siblings as well as the length of co-residence (i.e., time spent living in the same household) for each of their siblings. After data collection had begun a question regarding the amount of care provided for each sibling was added to this questionnaire. Following East and Hamill (2013), the question added was: "In general, how often do you take care of your brothers or sisters?" with response options of 1 = *hardly ever*, 2 = *a little*, 3 = *sometimes*, 4 = *often*, and 5 = *all the time*. Among the entire sample, approximately 25 % of participants answered this question.

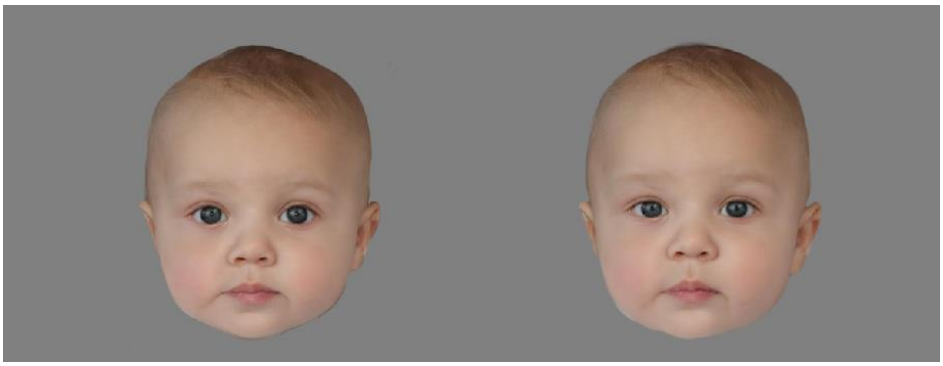
Face Stimuli

The stimuli used in the current study were the same as those used in Hahn et al. (2015a). Following previous work on infant cuteness (e.g., Hahn et al., 2013, 2015a, 2015b; Lobmaier et al., 2010; Sprengelmeyer et al., 2009), first 10 infant composite faces were created by averaging the shape, color, and texture cues of two individual faces (see Tiddeman, Burt, & Perrett, 2001) for more information regarding these computer graphic techniques). Cuteness (baby schema) prototypes that had been previously manufactured (see Hahn et al., 2013) were then used to modify the 2D linear shape of the facial composites by applying a transform based on a proportion of the difference in shape between the high-cute and low-cute prototypes to each face in order to manipulate the

appearance within a given identity. Each composite face was transformed -50% in cuteness (based on shape cues alone) to create the low-cute version and +50% cuteness to create the high-cute version (see Figure 1).

Figure 1

Example infant faces. The high cute version with enhanced baby schema is shown on the left while the low cute version with decreased baby schema is shown on the right.



Procedure

IRB approval (# 21-053) was granted on November 15, 2021. Participants signed up for the study via Cal Poly Humboldt's SONA research participation pool. Following Hahn et al. (2015a) participants completed a “pay-per-view” keypress task to assess the reward value of infant cuteness and a Likert-scale rating task to assess their sensitivity to infant cuteness. Participants completed both the keypress and rating task in a fully randomized order. This study was conducted entirely online and took approximately 15 minutes for participants to complete. Course credit was offered for any students who participated through Cal Poly Humboldt's SONA research participation pool.

Keypress task

Images of the 20 infant faces were presented in a fully randomized order. Participants could control the viewing time of each image by pressing the assigned keys on their keyboard. Participants were able to increase the length of time a face is presented

by pressing the 7 and 8 keys or decrease the length of time each face was presented by pressing the 1 and 2 keys. Each key press either increased or decreased the length of time a face is presented by 100 ms. The default viewing duration for every face was 4 s. The key-press task responses are an established predictor of the reward values of faces (Aharon et al., 2001). Key-press responses were scored for each face by subtracting the number of keypresses made to decrease the viewing time from those made to increase the viewing time. The key-press scores were used to determine each participant's cuteness reward score by subtracting the mean key-press score from the high-cuteness versions. Higher scores reflect a greater effect of cuteness on the reward value.

Rating task

Infant faces were presented in a fully randomized order and rated for cuteness on a scale from 1 (*not cute*) to 7 (*very cute*). Participant's cuteness perception was determined by subtracting the mean rating they give to the low-cuteness versions of infant faces from that they give to the high-cuteness versions. Higher scores thus reflect that cuteness has a greater effect on ratings.

Results

All analyses were conducted using R (4.1.2, R Core Team, 2021) and the ezANOVA (4.4-0) and lmerTest (3.1-3) packages. Following the protocol outlined in Hahn et al. (2015a), a cuteness reward score was calculated for the keypress data and a cuteness sensitivity score was calculated for the rating data. These scores are the average number of keypresses or the average cuteness rating for the high cute face versions minus the respective score for the low cute face versions. Therefore, higher scores reflect increased reward value of cuteness or sensitivity to cuteness. These cuteness reward scores and cuteness sensitivity scores served as the dependent variables (DV) in the analyses reported below. Prior to conducting the planned analysis, these DVs were inspected for kurtosis and skewness. Although the reward score data was not normally distributed, ANOVA is robust to non-normal data. Analyses were repeated with potential outliers (any value outside 3 *SD* from the mean) to ensure the pattern of results was not affected by potential outliers in the data.

Correlational analyses were performed to examine the relationships between variables in the study. A couple of the variables were in fact correlated including cuteness reward, cuteness sensitivity, and number of younger siblings. Results indicated a significant positive correlation between cuteness reward and cuteness sensitivity, r = .345, p = .012. This suggests that the more rewarding infant faces were, also associated to higher levels of sensitivity to cuteness. In other words, participants who viewed the infant faces for a longer amount of time, also rated the infant faces as cuter, compared to those who viewed them for a lesser amount of time. There was also a significant positive

correlation between total siblings and number of younger siblings, $r = .402$, $p < .001$. This makes sense because those who have more siblings have more possibilities of having a younger sibling.

First, one-sample *t*-tests comparing the cuteness reward and cuteness sensitivity scores to zero were performed to confirm that the cuteness manipulation was perceived by the participants. This preliminary analysis served as a manipulation check for infant cuteness. In line with previous studies using these stimuli (Hahn et al., 2015a, 2015b), the results showed that cuteness was rewarding, $t(54) = 1.92$, $p = .029$, $M = 1.79$, $SD = 6.90$, and participants were indeed sensitive to cuteness overall, $t(68) = 5.17$ $p < .001$, $M = 0.24$, $SD = 0.39$. These results confirm that participants could detect the manipulation of the infant faces, meaning they could tell the difference between the high baby schema faces compared to the low baby schema faces.

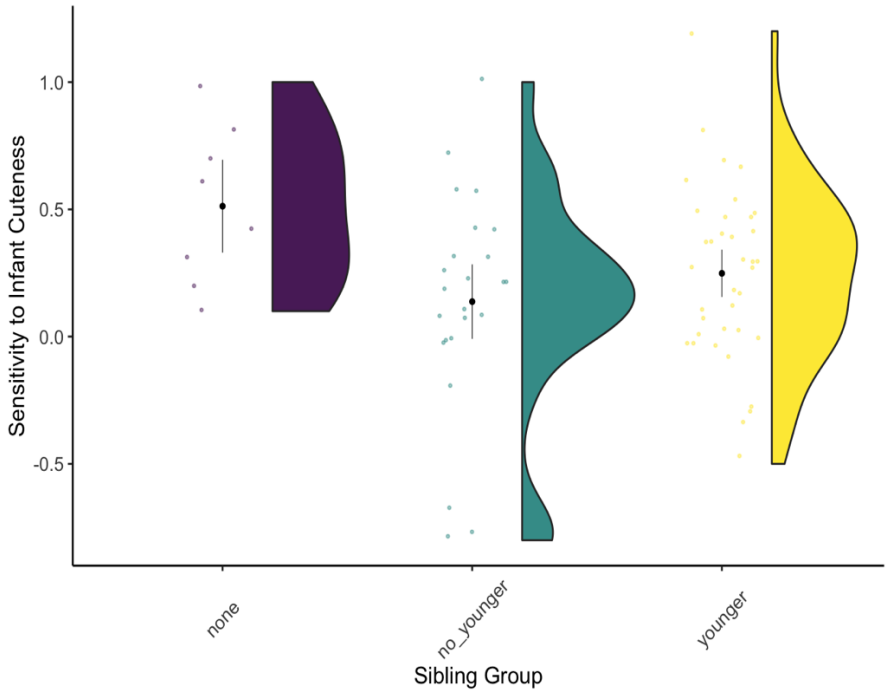
To test the first hypothesis for the predicted effect of having younger siblings on responses to infant cuteness, a one-way ANOVA was run separately for both the cuteness reward ($N = 55$) and cuteness sensitivity ($N = 69$) scores with sibling group (3 levels: no siblings, no younger siblings, younger siblings) as a between-subjects factor. Levene's Test of equality of variances was used to confirm the assumption of homogeneity of variance was met for these analyses. A sensitivity analysis (using the *pwr2ppl* package in R) indicated that a sample of 55 for reward value of cuteness gives a power of .13 to detect effects as small as $\eta 2 = 0.02$ while a sample of 69 for cuteness sensitivity gives a power of .56 to detect effects as small as $\eta 2 = 0.08$. This sensitivity analysis suggests that a greater amount of power is necessary to make a reliable prediction. This indicates that

the ability to detect an effect size is larger for cuteness sensitivity than reward value in this sample. However, larger sample sizes would be essential to improve the power of this study.

There were no significant differences between sibling groups for the reward value of cuteness, $F(2,52) = 0.49$ $p = .612$, $\eta^2_G = .02$, meaning that participants with younger siblings did not find cuteness any more rewarding than those without younger siblings. The cuteness sensitivity data revealed a marginally significant effect of sibling group, $F(2,66) = 3.01$, $p = .056$, $\eta^2_G = .08$. Contrary to the prediction, participants with no siblings appeared to be the most sensitive to infant cuteness (see Figure 2). Post-hoc comparisons (Bonferroni corrected) revealed that participants with no siblings were significantly more sensitive to cuteness than those with no younger siblings ($p = .052$) but not those with younger siblings ($p = .229$); those with younger siblings were not different from those without younger siblings ($p = .789$).

Figure 2

This graph illustrates the average rating scores of infant cuteness across sibling groups.



To explore whether the number of younger siblings and/or amount of care provided for younger siblings predicts responses to infant cuteness, regression analyses were run on the subset of participants who reported having at least one younger sibling and/or reported level of care provided for younger siblings. The number of younger siblings a participant had, did not significantly predict the reward value of infant cuteness, R^2 = .003, $F(1, 30) = 0.08$, b = .26, p = .779, n = 32. The number of younger siblings a participant had also did not significantly predict the sensitivity to infant cuteness, R^2 = .038, $F(1, 35) = 1.39$, b = .07, p = .246 n = 37. The amount of care a participant provided to a younger sibling did not significantly predict the reward value of infant cuteness, R^2 = .029, $F(1, 14) = 0.43$, b = - .85, p = .524, n = 16. The amount of

care a participant provided to a younger sibling also did not significantly predict the sensitivity to infant cuteness, $R^2 < .001$, $F(1, 17) = 0.01$, $b = -.01$, $p = .933$, $n = 19$. Overall, neither having more younger siblings nor the amount of care provided to those younger siblings influenced participants' responses to infant cuteness. However, given the small number of participants for the study, this analysis is exploratory in nature. A larger sample size is needed for a to provide a better understanding on how the number of younger siblings and/or amount of care provided for younger siblings predicts adult's responses to infant cuteness.

Discussion

Previous research has demonstrated that infant faces elicit positive responses and parental care from adults (Langlois et al., 1995; Alley, 1983), but less research has been studied on how caregivers other than the parents (i.e., alloparental caregivers) perceive infant faces. Some evidence shows that having siblings closer in age increases positive affective responses to young children's faces (Luo et al., 2015). This finding may suggest that having siblings could impact responses to young children's faces. The current study investigated the reward value of infant cuteness and cuteness sensitivity in adults with younger siblings, adults with older siblings, and adults without any siblings.

In line with previous research (Glocker et al., 2009a, 2009b; Hahn et al., 2015a, 2015b), participants overall spent more time viewing high baby schema infants compared to low baby schema infants, which demonstrates that infant cuteness is rewarding in general. Participants also rated the high baby schema infant faces as cuter than the low baby schema infant faces which confirms that the cuteness manipulation employed in the current study was effective. This manipulation, although subtle, significantly affected cuteness ratings suggesting that adults are sensitive to the baby schema in infant faces in general.

Contrary to my predictions, however, having siblings – and younger siblings in particular - did not impact the reward value of cuteness. There was no effect of sibling group (having younger siblings, having no younger siblings, not having any siblings) for the reward value of cuteness suggesting that all participants found cuteness equally rewarding, regardless of their exposure to siblings growing up. One possibility is that

simply having siblings does not translate to actual alloparental care activities which could impact responses to cuteness. To investigate this, an exploratory analysis was conducted to determine if the number of younger siblings a person had or the reported amount of caretaking they engaged in for their younger siblings impacted the reward value of cuteness. However, neither of these factors impacted the reward value of cuteness in this sample. It is worth noting that the sample size is small for this exploratory analysis and the power to detect an effect is likely limited.

Previous research demonstrating that having siblings predicts how much people like young children's faces (Luo et al., 2015) suggests that perhaps experience with siblings could impact perceptual responses but not reward-related responses to infants. Here, a moderately significant effect of sibling group was detected for sensitivity to infant cuteness; however, this effect was not in the direction predicted. I predicted that sensitivity to infant cuteness would increase for those participants with younger siblings because they would have likely had more caretaking experience and exposure to young children.

Incongruent to my prediction, the current findings show that sensitivity to infant cuteness is moderately increased for participants who had no siblings compared to those with siblings. Participants with no siblings were the most sensitive to infant cuteness, followed by those with younger siblings, and those without younger siblings appeared to be the least sensitive to cuteness. To my knowledge this trend that has not been reported in previous studies. My exploratory analysis for the subset of participants with younger siblings again showed that the number of younger siblings and amount of care

participants provided to their younger siblings did not predict their perceptual responses to infant cuteness.

The findings from this study do not support the original hypothesis that people with younger siblings would show an increased reward value and sensitivity to infant cuteness. However, sensitivity to infant cuteness was somewhat higher among the participants with no siblings compared to participants with siblings. Although this effect did not reach the threshold for statistical significance, it is interesting because participants with no siblings would likely have had the least amount of social experience with infants when growing up. A large body of research has demonstrated that experience with a given stimulus category leads to expertise and increased configural processing of stimuli (reviewed in Maurer et al., 2002). This would suggest that those with more experience with infants should be more sensitive to manipulations of the baby schema in infant faces.

Limitations

It is possible that infant faces do not show the same reliance on configural processing as adult faces (face processing has primarily been studied using adult face images). It is also possible that because the current study focused on past experiences, it failed to capture the full experiences people have with infants. For example, those without siblings may have, in the past or more recently, spend time with infants and children whether through caretaking (e.g., in a daycare setting), through having children of their own, or in other capacities that could influence their sensitivity to baby schema in infant faces. We also cannot exclude the idea that there may just be people who simply

enjoy babies overall and people who do not enjoy babies. There is some evidence that may support this idea. Hahn and colleagues (2015b) reported that women who scored higher on a maternal tendencies questionnaire positively predicted the reward value of infant faces.

There are a number of possible limitations for the current work. In particular, there is a relatively low sample size per group, especially for the regression models and the groups are not balanced. Another possible limitation of this study was that it was not assessed in a controlled environment. Due to COVID-19 restrictions, this study was completely online, so participants may have been distracted by various aspects going on in their environment. This is particularly relevant for the keypress study as a participant failing to engage would be recorded as no difference between the high and low cute versions. This is mitigated, however, using a spacebar press in between trials to ensure that participants are engaged with the task. It is also possible that participants do not understand the task, however, a brief training demonstration was presented using instructional slides before the experiment began to familiarize participants with the task.

Future Implications

The findings in this study reveal that experience with younger siblings does not influence how rewarding or sensitive participants are to infant cuteness. If anything, the results show that not having siblings could increase sensitivity to infant cuteness, although this finding needs to be further replicated. Future research should consider investigating if the age gap between siblings affects the reward value or sensitivity of infant faces. This may help expand the knowledge of the role of early social experience

with siblings on the development of the baby schema response. Another area of future research could include exploring the different types of alloparent caregivers such as extended family members (e.g., grandparents, cousins, aunts, uncles, etc.), which may provide a better understanding of how perceptions of infants differ among various types of caregivers. Specific questions regarding participants parental status and the amount of daily interactions and/or cumulative experience with young children should be included in future studies.

Lastly, the results from this experiment are particularly important for those who work in an environment with children including teachers, healthcare providers, and parents in general. As they are the most likely to experience these various caretaking behaviors produced when looking at infants or children.

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