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RESEARCH ARTICLE

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Evaluations of aggressive chasing interactions by 7-month-old infants

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Abstract

Recent theories of socio-moral development assume that humans evolved a capacity to evaluate others' social actions in different kinds of interactions. Prior infant studies found both reaching and visual preferences for the prosocial over the anti-social agents. However, whether the attribution of either positive or negative valence to agents' actions involved in an aggressive chasing interaction can be inferred by both reaching behaviors and visual attention deployment (i.e., disengagement of visual attention) is still an open question. Here we presented 7-month-old infants ($N = 92$) with events displaying an aggressive chasing interaction. By using preferential reaching and an attentional task (i.e., overlap paradigm), we assessed whether and how infants evaluate aggressive chasing interactions. The results demonstrated that young infants prefer to reach the victim over the aggressor, but neither agent affects visual attention. Moreover, such reaching preferences emerged only when dynamic cues and emotional face-like features were congruent with agents' social roles. Overall, these findings suggested that infants' evaluations of aggressive interactions are based on infants' sensitivity to some kinematic cues that characterized agents' actions and, especially, to the congruency between such motions and the face-like emotional expressions of the agents.

KEYWORDS

aggressive behavior, chasing, disengagement, infancy, visual attention

1 | INTRODUCTION

To select the best social partner, humans must attribute a positive or negative value to others' goal-directed actions. On which kind of social and perceptual cues this valence attribution is based on, and which is its origin during development are two intriguing research questions. Indeed, developmental researchers explored the ontogeny of social evaluation, providing evidence for an early-emerging process (for a recent review see Woo et al., 2022). In the last years, using a variety of paradigms, it has been demonstrated that preverbal infants make intuitive social evaluations by attributing a positive or negative valence to agents that are involved in different kinds of interactions (Geraci & Simion, 2022; Hamlin & Wynn, 2011; Hamlin et al., 2007, 2010; Kuhlmeier et al., 2003; Mascaro & Csibra, 2012; Premack & Premack, 1997).

Two theoretical views propose different explanations of the origin of the evaluation process. Kuhlmeier and colleagues (Kuhlmeier et al., 2014, 2020) support that infants' social evaluation becomes more sophisticated with age and can be adaptive for a later partner selection. They describe mechanisms underlying early social evaluations, which range from expectations of reciprocity based on the attribution of prosocial dispositions to a more general motivation to direct positively valenced behaviors toward positively valenced individuals. Other developmental researchers propose a different view, according to which an early emerging moral core that enables infants to make intuitive evaluations of others' actions is present from early on and allows infants to make sense of morally relevant behaviors (Ting et al., 2020; Van de Vondervoort & Hamlin, 2016; Woo et al., 2022).

Recent studies presented young infants with chasing interactions, in which only simple geometrical figures and only motion cues were available (Geraci & Simion, 2022; Kanakogi et al., 2013, 2017). Their findings demonstrated that infants can acquire socially rich information from the agents' actions, namely from their movements shown by a set of dynamic cues involving social causality. Moreover, these infant studies supported the view that infants evaluate others' actions based on the witnessed interactions between individuals (Hamlin et al., 2007; Van de Vondervoort & Hamlin, 2016).

Concerning visual cues that trigger the perception of chasing interactions, studies employing different chasing scenes, in which simple basic interaction between simple geometrical figures is displayed, demonstrated that infants perceived them as involved in a chasing interaction, and recognized their goal-directed behaviors by detecting spatially or temporarily coordinated motions (Csibra et al., 2003; Premack & Premack, 1997). From a developmental perspective, 5-month-old infants' visual attention is fine-tuned to interact with moving shapes (Rochat et al., 1997), and with agents that display goal-directed motion toward other agents (Galazka & Nyström, 2016). By the end of the first year of life, infants not only recognize a context of chasing but interpret it as a social interaction in which agents perform goal-directed actions (Csibra et al., 2003; Galazka et al., 2016).

Using the preferential reaching task to assess social preference, many other studies demonstrated an early-emerging ability to evaluate positively prosocial actions toward third parties, such as helping behaviors (Hamlin et al., 2007), distributive actions (Geraci & Surian, 2011) and protective interventions (Kanakogi et al., 2013, 2017). To assess younger infants' evaluations, some researchers used the preferential visual task. They found that infants as young as 3 months of age looked longer at the prosocial agents over the antisocial agents, for example after seeing a positive event in which an agent helped another agent to reach the top of a hill, and a negative event in which an agent knocked another agent down to the bottom of the hill (Hamlin & Wynn, 2011; Hamlin et al., 2010). Similarly, other researchers extended these findings to other social contexts. For example, 4-month olds looked longer at the fair over the unfair distributor (Geraci & Surian, 2023; Geraci, Simion, et al., 2022), as well as at the approacher over the repulser agent (Geraci, Regolin, et al., 2022).

Only two studies using both visual and reaching preference tasks found convergent responses in different prosocial interactions, such as helping behaviors (Hamlin et al., 2007, 2010) and distributive actions (Geraci & Surian, 2011; Geraci, Simion, et al., 2022). In other investigations, researchers did not find the same results with both measures, but only a reaching preference for the victim over the aggressor (Kanakogi et al., 2013) or a visual preference for the affiliative over the repulser (Geraci, Simion, et al., 2022). Taken together, these findings demonstrated how young infants' evaluations of aggressive interactions can be inferred from different behavioral measures, such as manual preference and visual attention (Wynn et al., 2018).

Intriguingly, a prior study found that 10-month-old infants, after seeing aggressive chasing, did not preferentially look at either the victim or the aggressor, while in the choice task, they chose the victim (Kanakogi et al., 2013). Therefore, it remains an intriguing open question whether infants' evaluation of aggressive interactions elicits not only reaching preferences, but also visual attention deployment (Vaish et al., 2008). It is well known that relevant social stimuli, such as faces (Morton & Johnson, 1991; Valenza et al., 1996), biological motion (Simion et al., 2008), and visual cues of motion that trigger animacy perception in adults (Di Giorgio et al., 2017, 2021), affect visual attention starting from birth. Indeed, selectively engaging attention on social stimuli and goal-relevant information is a prerequisite for goal-directed behavior (Garon et al., 2008). Basic aspects of visual attention may form building blocks for social cognition development (Salley et al., 2016). In addition to orienting attention, another basic aspect is the capability of visual disengagement of attention when two stimuli compete for attentional resources (i.e., the overlap task; Blaga & Colombo, 2006; Hood & Atkinson, 1993). This paradigm examines infants' gaze shifts from a central to a left or right peripheral stimulus that was presented together. Due to the temporally overlapping presentation of the two stimuli, a gaze shift to the peripheral stimulus requires active disengagement of attention from the central stimulus. The rationale is that the more salient the central stimulus, the more difficult it would be to disengage attention from such stimulus (i.e., in terms of longer saccadic latencies or number of fixations) to orient it towards the peripheral one. Interestingly, previous studies, using the overlap paradigm, demonstrated that negative emotional stimuli (i.e., fearful faces) modulated infants' visual attentional disengagement. For instance, it has been shown that 7-month-old infants disengaged their attention significantly less frequently from centrally presented fearful faces compared to happy faces or control stimuli to shift attention to neutral peripheral targets (Peltola et al., 2008; Peltola et al., 2009). Such results could be interpreted in light of the negativity-bias hypothesis, which assumes that infants, like adults, attend more to and are more influenced by negative rather than positive aspects of their environment (Vaish et al., 2008).

To the best of our knowledge, only one recent study has attempted to link the engagement of visual attention and behavioral agency attributions. Using a visual-spatial cueing paradigm (Posner, 1980), Wronski and colleagues (2022) demonstrated that 7-month-old infants' visual attention is modulated by the directionality of an object, but only when it was considered a social agent. Specifically, infants were first familiarized with an object displaying either agentive behavioral cues (self-propelled motion) or non-agentive movement (onset motion caused by external forces). Then, infants were presented with a spatial-cueing paradigm, in which the agent was displayed statically at the center of the screen as a cue. Target stimuli could appear at a location congruent or incongruent with the position of the agent's previous movement direction. Results showed that infants' gaze latencies were modulated (i.e., shorter gaze latencies toward congruent compared to incongruent targets) only by the object that moves in an agentive manner. This indicates that the orienting of attention in early infancy can be informed by top-down interpretations—in that case by attributions of directionality elicited by prior agency cues and directional actions (Wronski et al., 2022). Here, we sought to investigate whether, besides the directionality attribution to agents, the valence attribution (positive or negative respectively) for two chasing objects (the chased vs. the chaser), influences the deployment of visual attention early in life.

1.1 | The current study

The main goal of the present study was to investigate whether and how preverbal infants evaluate aggressive chasing interactions, and whether this evaluation is expressed through reaching preferences and visual attention disengagement. To this end, in four experiments, we familiarized 6- to 9-month-old infants with different aggressive chasing interactions in an aquatic scenario (i.e., an ultramarine blue aquarium, with moving air bubbles and sounds of water). Then, two tasks were administered to explore infants' evaluations: an overlap paradigm to measure attention disengagement followed by a visually guided reaching task to explore infants' personal preferences.

As for the overlap paradigm, we expect that infants' disengagement of attention will be modulated by the negative valence attribution—that is, longer gaze latencies to the peripheral target stimulus when the central cue will be the aggressive agent (i.e., the chaser), according to the general negativity-bias phenomenon (Peltola et al., 2008, 2009; Vaish et al., 2008). As for the reaching task, consistent with prior findings we expect infants to choose the victim (i.e., the chased), due to an early aversion to aggressive agents (Geraci, Regolin, et al., 2022).

2 | METHOD

2.1 | Apparatus

The stimuli were displayed on a computer screen (32 inches). A high-resolution video camera, mounted on the lower part of the screen allowed the recording of the child's eye movements for the whole duration of the experiment. The room was free of distractions and dimly lit to draw the child's attention toward the screen. The experimenter was hidden by a curtain and controlled both the subject's looking behavior and the execution of the experiment. The simultaneous and synchronized recording of the stimuli presented on the screen and the infants' looking behavior was made possible using Open Broadcaster Software (OBS Studio).

2.2 | Procedure

The infant sat on their parent's lap in front of the screen, placed at a distance of approximately 50 cm. Parents were invited to close their eyes during all experimental sessions, especially during the familiarization phase (i.e., when they saw bubbles on the screen). The testing session was divided into three different phases: a familiarization phase, an overlap task, and a manual reaching task. The familiarization phase consisted of the displaying of animations showing two geometric figures (e.g., a triangle or a circle[1]) engaged in a chasing interaction. The chasing movements were self-produced, characterized by changes in direction, speed, and intentional contingency, all typical characteristics of a chasing event (Galazka et al., 2016). The video had a total duration of 20 s. After familiarization, we implemented an overlap paradigm consisting of 16 trials. At the beginning of each trial, an attention-getter was presented consisting of a short graphic clip with sound (i.e., a colored moving rainbow or cloud) that appeared at the center of the screen. The experimenter initiated each test trial when the infant's sight was fixated on the attention-getter. Next, one of the two designated geometric figures of the chasing animation appeared in the center of the screen for 800 ms, then a white cross appeared peripherally to the right or left, and both stimuli (the white peripheral cross and the central geometric figure) remained static for 2000 ms. The saccadic latencies, defined as the time interval between the target onset and the onset of the saccade from the central cue to the lateral target (in milliseconds), were measured to investigate whether the attentional disengagement from the central figure was modulated by the negative or positive valence attribution of each geometric figure.

In a subsequent manual reaching task, infants were encouraged to choose between the chased and the chaser shape. A second experimenter, masked to the agents' identities, held the shapes in front of the infants, approximately 30 cm apart and initially out of reach. Infants were shown two 10 cm × 13 cm three-dimensional pictures of the chased and chaser. The pictures were placed in front of the infants using a 45 cm × 30 cm white foam tray. Infants were required to look at both shapes while the shapes were out of reach and later to choose one of the two; once they did so, the shapes were moved within reach. The experimenter asked: 'Who do you want? Pick it up!'. She looked at the child during the verbal request and then moved her gaze to the center of the white foam tray. The choice was determined online by the experimenter as the first object infants contacted with a visually-guided manual reach (for method see Hamlin et al., 2007). Infants that contacted agents without a visually-guided manual reach, or chose no agents were excluded from the non-parametric binomial test. The total duration of the experiment was about 5 min. The procedure was identical in all four experiments, except for specific characteristics of the stimuli used. All the stimuli were created using Flash Adobe Animation and were presented to the children using E-prime 2.0.

2.3 | Behavioral analysis

An offline frame-by-frame analysis of infants' looking behavior was done by one coder using VirtualDub 1.10.4 software (http://www.virtualdub.org). Before the frame-by-frame analysis, videos were converted using Format Factory 5.7.5 to have the same frame rate of 25 fps. The analysis focused on 2 different measures: 1) saccadic latencies are defined as the amount of time each child would take to shift their attention from the central stimuli to the peripheral cross. Saccade latencies of less than 100 ms or more than 1000 ms were excluded (Bardi et al., 2015; Daum & Gredebäck, 2011). To be included in the final data set, infants had to complete at least four valid trials (two for each condition/agent type). 2) Infants' manual choice is defined as the shape the child spontaneously touches and looks at during the manual choice task. A third experimenter, who was an expert in coding and masked to the familiarization events, coded both infants' visual and reaching responses.

2.4 | Statistical analyses

The analyses took into consideration two different variables: manual choice and saccadic latency, which respectively measured infants' social preferences in the manual task and disengagement in the attention task. Manual choice data were analyzed using exact binomial tests comparing the proportion of infants showing a social preference for the chased object/agent against the null hypothesis that infants' responses were at the chance, namely that infants showed no preference for either object/agent (proportion = 0.5). Paired *t*-tests were employed to compare infants' response latencies when presented with the chased and the chaser in the overlap paradigm. Both frequentist and Bayesian approaches were implemented. For Bayesian analysis, a default before $\sqrt{2}/2$ was used to be consistent with Morey et al. (2011). A factor of 1/2 was implemented to better scale the expected effect sizes typically seen in psychology. Moreover, a combined repeated-measures ANOVA was carried out considering the latency data with Experiment (Experiment 1, 2, 3, and 4) and agent [chaser vs. chased] as main crossed factors.

The sample sizes are aligned with previous studies that used the same paradigms and displayed chasing interactions (e.g., Kanakogi et al., 2013, 2017).

3 | EXPERIMENTS

3.1 | Experiment 1

Experiment 1 aimed to investigate whether preverbal infants evaluate aggressive chasing interactions and whether their evaluations are expressed through reaching preference and visual attention disengagement, after seeing events displayed solely by kinematic indices (i.e., without human-like face features, such as eyes, nose, and mouth). To do so, in the familiarization phase, we presented a video in which two figures were engaged in a chasing scene resulting in one figure becoming the positive agent (the one that is chased, the victim) and the other the bad agent (the one that chases, the aggressor) (see Ex 1.avi from https://osf.io/24brd/?view_only=ecdf9cf7d15c44f7bea46df276d2790d).

3.1.1 | Participants

Participants for Experiment 1 were 23 infants between 6 and 8 months of age (9 boys and 14 girls, M_{age} = 7.1, SD = 1.1 months; *age range* = 6.1–8.8 months). Three additional infants were assessed and excluded from analysis for fussiness due to some interruptions of E-prime software. The research was carried out at the BabyLab of the Department of Developmental Psychology and Socialization at the University of Padua. Participation was spontaneous and voluntary, upon the parent's signature of the informed consent which guaranteed the protection of the minor's data. The study was approved by the Ethical Committee of Psychological Research of the University of Padua (protocol number 3112).

3.1.2 | Stimuli

The familiarization videos showed a chasing scene depicting a simple triangle or pentagon (the chaser) and a circle or a square (the chased) on a blue background (see Figure 1). For half of the participants, the chaser was yellow and the chased was red, and vice-versa for the other half. The color and shapes of the figures were counterbalanced among participants to prevent children's looking behavior from being based on color or shape rather than the positive or negative valence carried out by each figure. The central stimuli used in the overlap paradigm consisted of the chased (N = 8 trials) or the chaser (N = 8 trials).

3.1.3 | Results

Nineteen out of the 23 participants chose the chased object in the visually-guided manual reach task (Figure 2a). The binomial exact test indicated that the proportion of infants displaying such preference was significantly higher than chance (p = .001). In the overlap paradigm, results indicated that infants' saccadic response latencies towards the peripheral stimulus were longer when the chaser was the central stimulus (M_{chaser} = 511, SD = 127 ms) compared to the chased (M_{chased} = 481, SD = 108 ms), however, the differences between the two stimuli were not statistically significant according to the frequentist approach [$t(22)$ = 1.25, p = .22; *Cohen'd* = 0.26]. According to the Bayesian analysis, there is anecdotal evidence for the null hypothesis, BF_{10} = 0.44 (i.e., the value is in the range of 0.33–1, so it favors the null hypothesis). See Figure 2b.

3.1.4 | Discussion

Results of Experiment 1 showed that infants prefer to reach the chased (i.e., the victim) over the chaser (i.e., the aggressor). On the contrary, infants' saccadic latencies towards the peripheral stimulus were comparable when the central image displayed the victim or the aggressor. Such results suggest that the valence attribution elicits

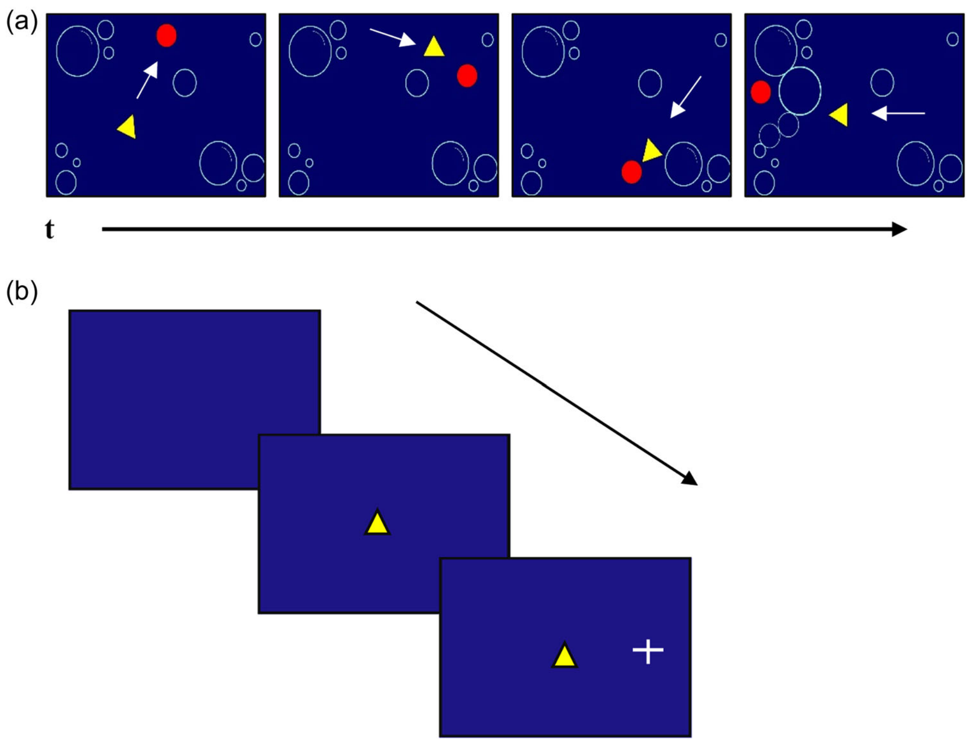

FIGURE 1 Schematic illustrations of familiarization events (a) and test trials (b) of Experiment 1. [Color figure can be viewed at wileyonlinelibrary.com]

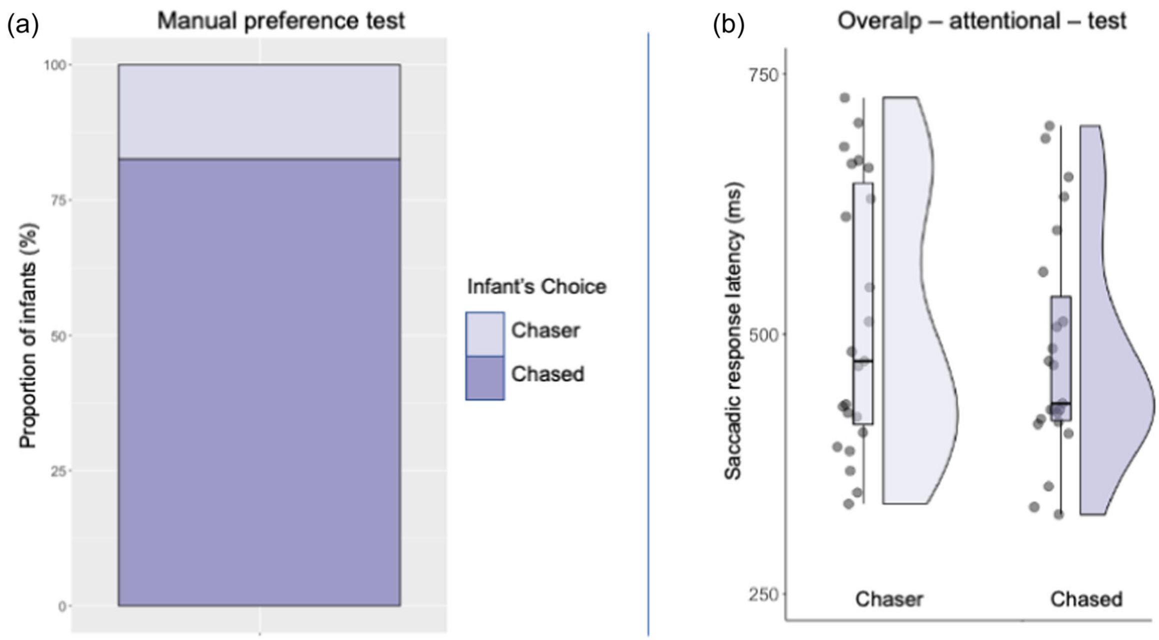

FIGURE 2 Results of Experiment 1. (a) Indicates the proportion (percentage) of infants showing a preference for the two stimuli (i.e., the chaser or the chased) in the manual reaching task. (b) The rain plots display the distribution of the mean saccadic response latencies or disengagement time (in milliseconds) measured in the overlap paradigm. In the box plots, each dot represents a participant's average response in the overlap paradigm and the black line indicates the mean of the responses across participants. The data are separately displayed for the chaser and the chased. [Color figure can be viewed at wileyonlinelibrary.com]

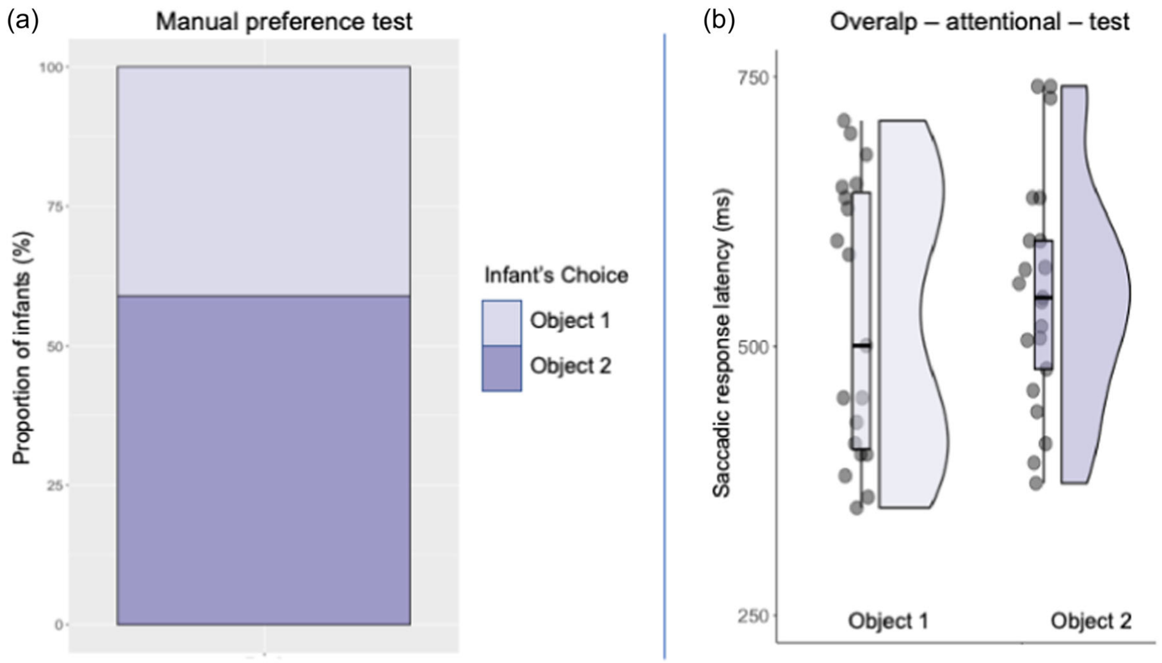

FIGURE 3 Results of Experiment 2—playful interaction. (a) Indicates the proportion (percentage) of infants showing a preference for the two stimuli (i.e., Object 1 or Object 2) in the manual reaching task. (b) The rain plots display the distribution of the mean saccadic response latencies or disengagement time (in milliseconds) measured in the overlap paradigm. In the box plots, each dot represents a participant's average response in the overlap paradigm and the black line indicates the mean of the responses across participants. The data are separately displayed for the chaser and the chased. [Color figure can be viewed at wileyonlinelibrary.com]

reaching preferences, but it does not affect disengagement of visual attention.

Therefore, to control that the reaching preference obtained in Experiment 1 was specifically due to infants' social evaluation, in Experiment 2 infants were presented with a chasing event where the two agents displayed playful, rather than aggressive, interacting motions.

3.2 | Experiment 2

This experiment explores whether the findings of Experiment 1 are specific to aggressive chasing interactions. Experiment 2 used the same procedure, apparatus, and analyses as Experiment 1, except that the familiarization video while presenting contingent and interacting motions, consisted of playful interaction between the two geometric figures, which were different for both color and shape: an orange square (i.e., the Object 1) and a green pentagon (i.e., the Object 2) (see Ex 2.avi from https://osf.io/24brd/?view_only=ecdf9cf7d15c44f7bea46df276d2790d).

3.2.1 | Participants

A different group of 23 infants between 6 and 8 months of age (11 boys and 12 girls, $M_{age} = 7.2$, SD = 1.1 months; *age range* 6.1–9.3 months) participated in this study.

3.2.2 | Results

Only 17 out of the 23 participants expressed a manual preference. The binomial exact test indicated that the proportion of infants displaying a preference for one of the objects was not significantly different from chance (7 chose one object, 10 chose another object, $p = .83$; Figure 3a). In the attentional task, the results of the frequentist approach indicated no significant differences [$t(22) = 0.63$, $p = .53$; *Cohen'd* = 0.13; Figure 3b] between the infants' saccadic responses latencies for one of the geometrical objects ($M_{playfulObj1}$ = 571, SD = 154 ms) compared to the other object ($M_{playfulObj2}$ = 589, SD = 177 ms). Moreover, $BF_{10} = 0.26$ shows moderate evidence for the null hypothesis.

3.2.3 | Discussion

Results of Experiment 2 suggested that infants' reaching preference for the chased over the chaser found in Experiment 1 was possible only with the specific kinematics embedded in the aggressive chasing interaction. These data are in line with prior findings on infants' reaching preference for prosocial over antisocial agents (for other social interactions see Geraci, Simion, et al., 2022; Hamlin et al., 2007; Kanakogi et al., 2017). Like in the previous experiment, no significant difference between the saccadic latencies for one of the objects compared to the other was observed in the overlap test.

A possible explanation of this latter result may be that when the two stimuli are presented separately from each other, and not within a dynamic interaction like in the chasing event, the infant is equally attracted to both the victim and the aggressor. That is, in the face of a centrally presented stimulus with a positive or negative valence in competition with a laterally presented neutral stimulus (a cross), infants may fixate the same amount of time the central stimulus to assimilate or categorize the information, independently from its positive or negative valence (Cohen, 1973). This explains the almost equal performance in attention disengagement from one and the other stimulus.

Another intriguing possibility has to do with the absence of face-like emotional features within the geometrical shapes. Faces play an important role in guiding visual attention, and they immediately attract visual attention when people are looking at static images (Cerf et al., 2007). Starting from birth, infants are attracted not only by simple cues of motion that characterized social agents (Di Giorgio et al., 2017, 2021; Simion et al., 2008) but also by the presence of a face (Morton & Johnson, 1991; Valenza et al., 1996), the eye-gaze (Farroni et al., 2002) and facial expression (Farroni et al., 2007). In Experiment 3, we investigated whether the presence of additional human-like facial features of the interacting agents can facilitate the disengagement of visual attention.

3.3 | Experiment 3

This experiment investigates whether additional social features (i.e., evident physical characteristics such as eyes, nose, and mouth) of the interacting objects within the aggressive chasing interaction event can modulate reaching preferences and attentional disengagement. According to the general negativity-bias already described (Vaish et al., 2008), we expect to obtain a modulation of visual attention, in terms of longer saccadic latency towards the peripheral neutral stimulus when the aggressive agent is the central cue, compared to when the central one is the victim agent. Experiment 3 used the same procedure, apparatus, and analyses as Experiment 1.

3.3.1 | Participants

Participants for Experiment 3 were 23 infants between 5 and 10 months of age (14 boys and 9 girls, $M_{age} = 7.2$, SD = 1.5 months; *age range* = 5.1–10.3 months). One participant was excluded from the analyses due to outlier response latencies in the attentional task (latency <1000 ms).

3.3.2 | Stimuli

The stimuli in Experiment 3 consisted of the same geometrical figures used in Experiment 1 with the addition of human-like features, namely eyes, nose, and mouth showing neutral expressions in both agents. As in experiment 1, in the familiarization phase, the animation showed a chasing scene. In particular, the triangle with human features (chaser) chased the circle with human features (chased) (see Ex 3.avi from https://osf.io/24brd/?view_only=ecdf9cf7d15c44f7bea46df276d2790d).

3.3.3 | Results

Only 19 out of the 22 participants showed a manual reaching preference. Ten out of these 19 participants chose the chased object in the manual preference task (Figure 4a). The binomial exact test indicated that the proportion of infants displaying such preference was not significantly higher than chance ($p = .74$). In the overlap paradigm, the results indicated that infants' saccadic response latencies towards the peripheral stimulus were longer when the chaser was the central stimulus ($M_{chaser} = 610$, SD = 185 ms) compared to the chased ($M_{chased} = 598$, SD = 153 ms), however, the differences between the two stimuli were not statistically significant using the frequentist approach $t(21) = .42$, $p = .68$; *Cohen'd* = .09; Figure 4b). According to the Bayesian analysis, there is moderate evidence for the null hypothesis ($BF_{10} = 0.24$).

3.3.4 | Discussion

Surprisingly, no reaching preference for either agent, as well as no significant difference in saccadic latencies between the chaser and chased were found. Previous studies, using the reaching paradigm with agents with neutral facial features did not show aggressive interactions, but events displaying prosocial or antisocial behaviors, such as helping behaviors (Hamlin et al., 2007), distribution actions (Geraci & Surian, 2011) or protective interventions (Kanakogi et al., 2017). Thus, a possible confound may be because we add face-like features with neutral expressions to agents that have specific roles in the chasing events since the chaser is an aggressor and the chased is a victim. Broadly speaking, such neutral facial features are incongruent with the emotions normally elicited by agents in a chased situation. The current results extend previous findings supporting an earlier emotional detection, revealing infants' perception of emotions (for a review see Ruba & Pollak, 2020), rudimentary sympathy (Kanakogi et al., 2013), and early concerns for others in distress (Davidov et al., 2021). To assess this hypothesis, we carried out Experiment 4 and provided new information about agents' emotions, by adding agents' facial features that were congruent to agents' emotions (i.e., an evil face for chaser and a fear face for chased).

3.4 | Experiment 4

In Experiment 4, like in Experiment 3, new face features were added to both chaser and chased agents to investigate the influence of social features on both reaching preferences and attention

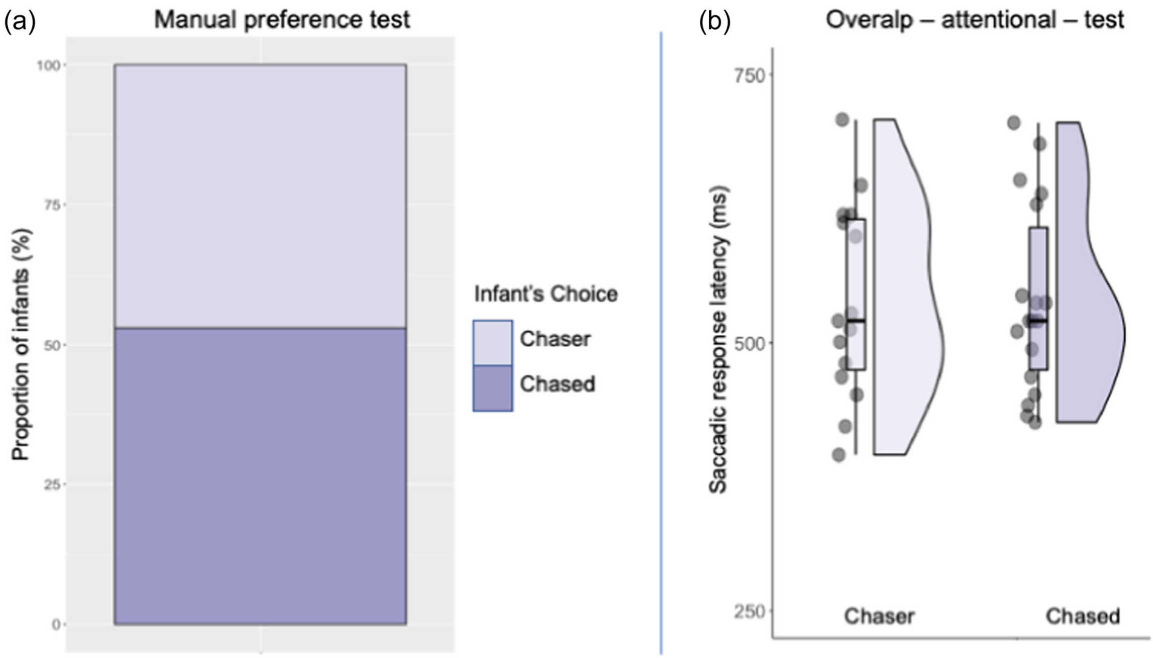

FIGURE 4 Results of Experiment 3—with face features and neutral expressions. (a) Indicates the proportion (percentage) of infants showing a preference for the two stimuli (i.e., the chaser or the chased) in the manual reaching task. (b) The rain plots display the distribution of the mean saccadic response latencies or disengagement time (in milliseconds) measured in the overlap paradigm. In the box plots, each dot represents a participant's average response in the overlap paradigm and the black line indicates the mean of the responses across participants. The data are separately displayed for the chaser and the chased. [Color figure can be viewed at wileyonlinelibrary.com]

disengagement. Experiment 4 used the same procedure, apparatus, and analyses as in Experiment 3. However, differently from Experiment 3, here the chased figure with human features displayed an emotional expression of fear, whereas the chaser displayed an evil emotional expression.

3.4.1 | Participants

Participants for Experiment 4 were 23 infants between 6 and 8 months of age (11 boys and 12 girls, M_{age} = 7.2, SD = 0.8 months; *age range* = 6.2–8.7 months). However, 3 participants were excluded because they did not reach the required number of trials throughout the experiment in at least one of the conditions.

3.4.2 | Stimuli

The stimuli in Experiment 4 consisted of the same geometrical figures used in Experiment 3 with the addition of emotional expressions (i.e., chased: fear; chaser: evil) in both agents. The aggressive and fearful features were implemented in the animation of the familiarization phase. As in previous experiments, the stimuli used in the manual reaching task and the overlap paradigm displayed a neutral facial expression to avoid confounds (see Ex 4.avi from https://osf.io/24brd/?view_only=ecdf9cf7d15c44f7bea46df276d2790d).

3.4.3 | Results

Eighteen out of the 20 participants expressed a manual preference. Thirteen out of these chose the chased object in the manual preference test (Figure 5a). The binomial exact test indicated that the proportion of infants displaying such preference was significantly higher than chance (p = .04). In the attentional task, the results indicated that infants' saccadic response latencies towards the peripheral stimulus were longer for the chased (M_{chaser} = 641, SD = 175 ms) compared to the chaser (M_{chaser} = 623, SD = 120 ms), however, the differences between the two stimuli were not statistically significant t (19) = .41, p = .69; *Cohen'd* = .09; Figure 5b). According to the Bayesian analysis, there is moderate evidence for the null hypothesis (BF_{10} = 0.25).

3.4.4 | Discussion

Like in Experiment 1, results showed that (i) infants prefer to reach the chased over the chaser, and (ii) that the attribution of valence does not affect disengagement of visual attention (i.e., saccadic latencies). Reaching preference suggests that infants make social evaluations by attributing a valence to agents involved in a chasing interaction, especially when facial expressions are congruent with the emotions elicited in the context of aggressive chasing.

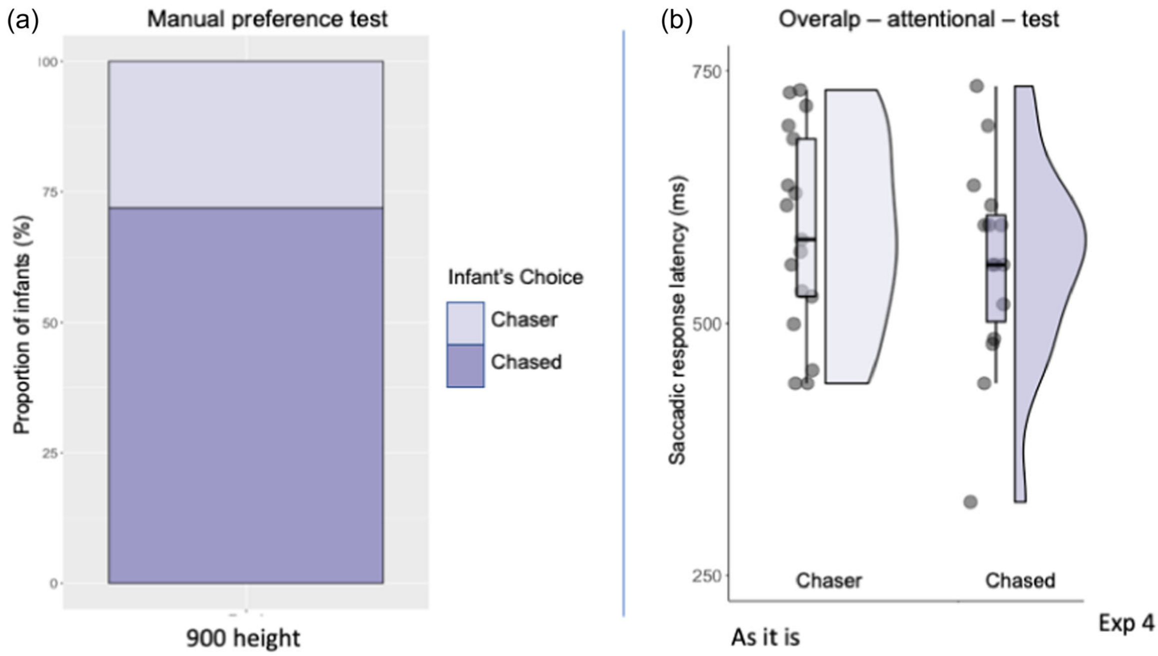

FIGURE 5 Results of Experiment 4—with human features and congruent emotions in both agents. (a) Indicates the proportion (percentage) of infants showing a preference for the two stimuli (i.e. the chaser or the chased) in the manual reaching task. (b) The rain plots display the distribution of the mean saccadic response latencies or disengagement time (in milliseconds) measured in the overlap paradigm. In the box plots, each dot represents a participant's average response in the overlap paradigm and the black line indicates the mean of the responses across participants. The data are separately displayed for the chaser and the chased. [Color figure can be viewed at wileyonlinelibrary.com]

3.5 | Comparison between experiments

The results of the ANOVA with saccadic response latencies as the dependent variables indicated a significant effect of the Experiment [$F(3,168) = 6.51$, $p < .001$, $\eta_p^2 = 0.1$] and no main effect of the agent [$F(1,168) = 0.006$, $p > .94$, $\eta_p^2 = 0.0005$], or a significant interaction between factors [$F(3,168) = 0.28$, $p = .64$, $\eta_p^2 = 0.004$]. Post-hoc corrected pairwise analysis showed that the main effect of the Experiment was due to differences between Experiment 1 and Experiments 2, 3, and 4 (all corrected $p < .05$). Specifically, participants in Experiment 1 responded faster than participants in the other Experiments. No significant differences were observed among Experiments 2, 3, and 4.

These results demonstrated that the attribution of positive or negative valence did not affect saccadic reaction times in all experiments, suggesting that this result does not appear to be attributable to the encoding and processing of the stimuli (i.e., agents) but to the maturation of the brain areas that mediate disengagement of attention (Blaga & Colombo, 2006).

4 | GENERAL DISCUSSION

The present study investigated whether and how the positive and negative valence attributions to aggressive chasing interactions modulate social reaching preferences and disengagement of visual attention in 7-month-old infants. It adds to the currently available evidence on the early-emerging evaluation process, by demonstrating a reaching preference for chased over the chaser agents (Experiment 1). Such evaluations in a chasing interaction extend prior findings on infants' preferences for prosocial agents involved in a variety of social interactions (e.g., helper vs. hinderer agents: Hamlin et al., 2007, 2010; fair vs. unfair distributors: Geraci & Surian, 2011, 2023; interfering vs. non-interfering agents: Kanakogi et al., 2017; approacher vs. repulser agents: Geraci, Simion, et al., 2022).

Intriguingly, the current results also demonstrated that when face-like features, such as eyes and mouth were added to the geometrical shapes, infants manifested a reaching preference for the chased over the chaser only when their emotional expressions were congruent with its agentive behavior (Experiment 4). Specifically, they preferred the chased when its face-like features expressed fear, which is an emotional state compatible with the role of the victim. By contrast, when the motion and the emotional expressions of the chaser and chased were incongruent because they resembled a neutral expression, the preference was lost (Experiment 3).

Our findings shed light also on the role of emotional expression features in the evaluation process. A reaching preference for the chased is consistent with an evaluation of the roles of victims (i.e., chased) and aggressors (i.e., chaser) in interactions (i.e., aggressors/chaser), and extend prior findings on early sympathy and concern for others in distress (Davidov et al., 2021; Kanakogi et al., 2013, 2017).

These data are consistent with prior findings revealing that infants make intuitive evaluations (Haidt & Joseph, 2008; Van de Vondervoort & Hamlin, 2016, 2018) and that such evaluations of aggressive interactions, at least in our experiments, are based on infants' sensitivity to some kinematic cues that characterized agents' actions and, especially, to the congruency between such motions and the face-like emotional expressions of the agents. From an evolutionary point of view, such basic evaluations it can be evolved to enforce cooperation later during development (Axelrod & Hamilton, 1981; Cosmides & Tooby, 1992).

Crucially, the current findings are in line with prior studies on preverbal infants' evaluations of aggressive interactions, by providing additional evidence of infants' reaching preference for victims over aggressors (Kanakogi et al., 2013). Moreover, by comparing the present results to those of Kanakogi and colleagues (2013), these findings demonstrated how early evaluations can be modulated by infants' perception of others' emotions, since a significant reaching preference for the victim over the aggressor emerged when emotional face-like features (and not only dynamic cues) were congruent with agents' social roles.

About visual attention, results demonstrate that infants' attribution of positive or negative valence to geometrical shapes involved in aggressive chasing interactions does not affect the disengagement of attention. Specifically, when the chased and the chaser were not displayed together in a dynamic situation such as in the chasing event, they attracted infants' attention to a similar extent (in terms of saccadic latency). Thus, no significant differences were observed when the central cue was the agent with negative valence versus positive valence. One possible explanation for these results can be found in the most recent literature which questions the importance of this negativity bias in infancy (Baumeister et al., 2001; Vaish et al., 2008). Indeed, it has been suggested that biases in perceiving either positive or negative information are dynamic over the lifespan, with the dominant patterns of a positivity advantage or no valence effect (Kauschke et al., 2019). Another complementary explanation may be that infants find it easier to express their social evaluations when the two agents acting on a scene are present together, like in the manual choice task. On the contrary, when the two stimuli are presented separately from each other, like in the attentional task, the infant is not able to compare them and as a consequence, independently from their positive or negative valence, both stimuli equally attract the infant's attention (Cohen, 1973; Lewis et al., 1966). Considering this, it might be interesting to study within the overlap paradigm what happens when the two stimuli, chased and chaser, are presented simultaneously and compete for infants' attention. Indeed, prior research found that the valence of attribution to geometrical shapes in events displaying prosocial interactions affects infants' visual preferences. In particular, some researchers using a preferential-looking paradigm found that infants from 3 months of age preferred to look longer at the prosocial agent (i.e., helper) over the antisocial agent (i.e., hinderer) (Hamlin & Wynn, 2011; Kiley Hamlin et al., 2010), and from 4 months of age, they showed a visual preference for affiliative over repulser agents (Geraci, Simion, et al., 2022) as well as for fair over unfair distributors (Geraci & Surian, 2023). These results have methodological implications since they suggest that following the evaluation process, in a preferential-looking task when both the positive and negative agents are presented simultaneously, infants' visual preference is driven by positive information. In contrast, in an overlap task when the central cue is either positive or negative and the peripheral target stimulus is a neutral stimulus (i.e., a white cross), the disengagement of visual attention is affected by both negative and positive information in an equal manner.

A potential limitation in the present study has to do with attracting stimuli in the familiarization events (such as bubbles). While the sounds of these stimuli may have helped infants maintain their attention on the screen, the moving bubbles may have worked as potential distractors. Future studies could remove moving bubbles in the scenario, to reduce possible sources of distraction.

In sum, these results presented here provide new evidence that infants' attribution of positive or negative value to agents involved in an aggressive chasing interaction does not affect the modulation of visual attention in terms of disengagement. These findings also confirmed that infants' attributions affect the choice of the social partner as reflected by their reaching and approaching the positive-prosocial agents.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data and stimuli can be found here: https://osf.io/24brd/?view_only=ecdf9cf7d15c44f7bea46df276d2790d.

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ENDNOTE

[1] Geometric figures are usually preferred in this research field, as they are less complex and easier to process for infants than real-world stimuli (Geraci & Surian, 2023; Hamlin et al., 2007, 2010; Kanakogi et al., 2017; Hamlin & Wynn, 2011; Geraci & Simion, 2022; Geraci, Regolin, et al., 2022; Kanakogi et al., 2013; Kuhlmeier et al., 2003; Premack & Premack, 1997; for a recent review see Kominsky et al., 2022).

REFERENCES

Axelrod, R., & Hamilton, W. D. (1981). The evolution of cooperation. *Science*, *211*(4489), 1390–1396. https://doi.org/10.1126/science.7466396

Bardi, L., Di Giorgio, E., Lunghi, M., Troje, N. F., & Simion, F. (2015). Walking direction triggers visuospatial orienting in 6-month-old infants and adults: An eye-tracking study. *Cognition*, *141*, 112–120. https://doi.org/10.1016/j.cognition.2015.04.014

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*(4), 323–370. https://doi.org/10.1037/1089-2680.5.4.323

Blaga, O. M., & Colombo, J. (2006). Visual processing and infant ocular latencies in the overlap paradigm. *Developmental Psychology*, *42*(6), 1069–1076. https://doi.org/10.1037/0012-1649.42.6.1069

Cerf, M., Harel, J., Einhäuser, W., & Koch, C. (2007). Predicting human gaze using low-level saliency combined with face detection. *Advances in Neural Information Processing Systems, 20th Proceedings of the 2007 conference*, 1–8.

Cohen, L. B. (1973). A two process model of infant visual attention. *Merrill-Palmer Quarterly of Behavior and Development*, *19*(3), 157–180. https://www.jstor.org/stable/23084033

Cosmides, L., & Tooby, J. (1992). Cognitive adaptations for social exchange. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 163–228). Oxford University Press.

Csibra, G., Bíró, S., Koós, O., & Gergely, G. (2003). One-year-old infants use teleological representations of actions productively. *Cognitive Science*, *27*(1), 111–133. https://doi.org/10.1207/s15516709cog2701_4

Daum, M. M., & Gredebäck, G. (2011). The development of grasping comprehension in infancy: Covert shifts of attention caused by referential actions. *Experimental Brain Research*, *208*, 297–307. https://doi.org/10.1007/s00221-010-2479-9

Davidov, M., Paz, Y., Roth-Hanania, R., Uzefovsky, F., Orlitsky, T., Mankuta, D., & Zahn-Waxler, C. (2021). Caring babies: concern for others in distress during infancy. *Developmental Science*, *24*(2), e13016. https://doi.org/10.1111/desc.13016

Farroni, T., Csibra, G., Simion, F., & Johnson, M. H. (2002). Eye contact detection in humans from birth. *Proceedings of the National Academy of Sciences*, *99*(14), 9602–9605. https://doi.org/10.1073/pnas.152159999

Farroni, T., Menon, E., Rigato, S., & Johnson, M. H. (2007). The perception of facial expressions in newborns. *European Journal of Developmental Psychology*, *4*(1), 2–13. https://doi.org/10.1080/17405620601046832

Galazka, M., Bakker, M., Gredebäck, G., & Nyström, P. (2016). How social is the chaser? Neural correlates of chasing perception in 9-month-old infants. *Developmental Cognitive Neuroscience*, *19*, 270–278. https://doi.org/10.1016/j.dcn.2016.05.005

Galazka, M., & Nyström, P. (2016). Visual attention to dynamic spatial relations in infants and adults. *Infancy: The official journal of the International Society on Infant Studies*, *21*(1), 90–103. https://doi.org/10.1111/infa.12091

Garon, N., Bryson, S. E., & Smith, I. M. (2008). Executive function in preschoolers: A review using an integrative framework. *Psychological Bulletin*, *134*(1), 31–60. https://doi.org/10.1037/0033-2909.134.1.31

Geraci, A., Regolin, L., Simion, F., & Surian, L. (2022). Infants' preferences for approachers over repulsers shift between 4 and 8 months of age. *Aggressive Behavior*, *48*(5), 487–499. https://doi.org/10.1002/ab.22033

Geraci, A., & Simion, F. (2022). Evaluation of prosocial actions performed by dynamic shapes at 17 months of age. *European Journal of Developmental Psychology*, *19*(6), 785–809. https://doi.org/10.1080/17405629.2021.1957823

Geraci, A., Simion, F., & Surian, L. (2022). Infants' intention-based evaluations of distributive actions. *Journal of Experimental Child Psychology*, *220*, 105429. https://doi.org/10.1016/j.jecp.2022.105429

Geraci, A., & Surian, L. (2011). The developmental roots of fairness: Infants' reactions to equal and unequal distributions of resources. *Developmental Science*, *14*, 1012–1020. https://doi.org/10.1111/j.1467-7687.2011.01048.x

Geraci, A., & Surian, L. (2023). Intention-based evaluations of distributive actions by 4-month-olds. *Infant Behavior and Development*, *70*), 101797. https://doi.org/10.1016/j.infbeh.2022.101797

Di Giorgio, E., Lunghi, M., Simion, F., & Vallortigara, G. (2017). Visual cues of motion that trigger animacy perception at birth: The case of self-propulsion. *Developmental Science*, *20*(4), e12394.

Di Giorgio, E., Lunghi, M., Vallortigara, G., & Simion, F. (2021). Newborns' sensitivity to speed changes as a building block for animacy perception. *Scientific Reports*, *11*(1), 542. https://doi.org/10.1038/s41598-020-79451-3

Haidt, J., & Joseph, C. (2008). The moral mind: How 5 sets of innate moral intuitions guide the development of many culture-specific virtues, and perhaps even modules. In P. Carruthers, S. Laurence, & S. Stich (Eds.), *The innate mind* (Vol. 3, pp. 367–391). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195332834.003.0019

Hamlin, J. K., & Wynn, K. (2011). Young infants prefer prosocial to antisocial others. *Cognitive Development*, *26*(1), 30–39. https://doi.org/10.1016/j.cogdev.2010.09.001

Hamlin, J. K., Wynn, K., & Bloom, P. (2007). Social evaluation by preverbal infants. *Nature*, *450*(7169), 557–559. https://doi.org/10.1038/nature06288

Hood, B. M., & Atkinson, J. (1993). Disengaging visual attention in the infant and adult. *Infant Behavior & Development*, *16*(4), 405–422. https://doi.org/10.1016/0163-6383(93)80001-O

Kanakogi, Y., Inoue, Y., Matsuda, G., Butler, D., Hiraki, K., & Myowa-Yamakoshi, M. (2017). Preverbal infants affirm third-party interventions that protect victims from aggressors. *Nature Human Behaviour*, *1*(2), 0037. https://doi.org/10.1038/s41562-016-0037

Kanakogi, Y., Okumura, Y., Inoue, Y., Kitazaki, M., & Itakura, S. (2013). Rudimentary sympathy in preverbal infants: Preference for others in distress. *PLoS One*, *8*(6), e65292. https://doi.org/10.1371/journal.pone.0065292

Kauschke, C., Bahn, D., Vesker, M., & Schwarzer, G. (2019). The role of emotional valence for the processing of facial and verbal stimuli—Positivity or negativity bias? *Frontiers in Psychology*, *10*, 1654. https://doi.org/10.3389/fpsyg.2019.01654

Kiley Hamlin, J., Wynn, K., & Bloom, P. (2010). Three-month-olds show a negativity bias in their social evaluations. *Developmental Science*, *13*(6), 923–929. https://doi.org/10.1111/j.1467-7687.2010.00951.x

Kominsky, J. F., Lucca, K., Thomas, A. J., Frank, M. C., & Hamlin, J. K. (2022). Simplicity and validity in infant research. *Cognitive Development*, *63*, 101213. https://doi.org/10.1016/j.cogdev.2022.101213

Kuhlmeier, V., Wynn, K., & Bloom, P. (2003). Attribution of dispositional states by 12-month-olds. *Psychological Science*, *14*(5), 402–408. https://doi.org/10.1111/1467-9280.01454

Kuhlmeier, V. A., Dunfield, K. A., & O'Neill, A. C. (2014). Selectivity in early prosocial behavior. *Frontiers in Psychology*, *5*, 836. https://doi.org/10.3389/fpsyg.2014.00836

Kuhlmeier, V. A., Karasewich, T., & Dunfield, K. A. (2020). Selective prosocial behavior in early childhood. In J. Decety (Ed.), *The social brain: A developmental perspective* (pp. 247–262). MIT Press.

Lewis, M., Kagan, J., & Kalafat, J. (1966). Patterns of fixation in the young infant. *Child Development*, *37*(2), 331–341. https://doi.org/10.2307/1126807

Mascaro, O., & Csibra, G. (2012). Representation of stable social dominance relations by human infants. *Proceedings of the National Academy of Sciences*, *109*(18), 6862–6867. https://doi.org/10.1073/pnas.1113194109

Morey, R. D., Rouder, J. N., Pratte, M. S., & Speckman, P. L. (2011). Using MCMC chain outputs to efficiently estimate Bayes factors. *Journal of Mathematical Psychology*, *55*, 368–378.

Morton, J., & Johnson, M. H. (1991). CONSPEC and CONLERN: A two-process theory of infant face recognition. *Psychological Review*, *98*(2), 164–181. https://doi.org/10.1037/0033-295X.98.2.164

Peltola, M. J., Leppänen, J. M., Palokangas, T., & Hietanen, J. K. (2008). Fearful faces modulate looking duration and attention disengagement in 7-month-old infants. *Developmental Science*, *11*(1), 60–68. https://doi.org/10.1111/j.1467-7687.2007.00659.x

Peltola, M. J., Leppänen, J. M., Vogel-Farley, V. K., Hietanen, J. K., & Nelson, C. A. (2009). Fearful faces but not fearful eyes alone delay attention disengagement in 7-month-old infants. *Emotion*, *9*(4), 560–565. https://doi.org/10.1037/a0015806

Posner, M. I. (1980). Orienting of attention. *Quarterly Journal of Experimental Psychology*, *32*(1), 3–25. https://doi.org/10.1080/00335558008248231

Premack, D., & Premack, A. J. (1997). Infants attribute value to the goal-directed actions of self-propelled objects. *Journal of Cognitive Neuroscience*, *9*(6), 848–856. https://doi.org/10.1162/jocn.1997.9.6.848

Rochat, P., Morgan, R., & Carpenter, M. (1997). Young infants' sensitivity to movement information specifying social causality. *Cognitive Development*, *12*(4), 537–561. https://doi.org/10.1016/S0885-2014(97)90022-8

Ruba, A. L., & Pollak, S. D. (2020). The development of emotion reasoning in infancy and early childhood. *Annual Review of Developmental Psychology*, *2*, 503–531. https://doi.org/10.1146/annurev-devpsych-060320-102556

Salley, B., Sheinkopf, S. J., Neal-Beevers, A. R., Tenenbaum, E. J., Miller-Loncar, C. L., Tronick, E., Lagasse, L. L., Shankaran, S., Bada, H., Bauer, C., Whitaker, T., Hammond, J., & Lester, B. M. (2016). Infants' early visual attention and social engagement as developmental precursors to joint attention. *Developmental Psychology*, *52*(11), 1721–1731. https://doi.org/10.1037/dev0000205

Simion, F., Regolin, L., & Bulf, H. (2008). A predisposition for biological motion in the newborn baby. *Proceedings of the National Academy of Sciences*, *105*(2), 809–813. https://doi.org/10.1073/pnas.0707021105

Ting, F., Dawkins, M., Stavans, M., & Baillargeon, R. (2020). Principles and concepts in early moral cognition. In J. Decety (Ed.), *The social brain: A developmental perspective* (pp. 41–65). MIT Press.

Vaish, A., Grossmann, T., & Woodward, A. (2008). Not all emotions are created equal: The negativity bias in social-emotional development. *Psychological Bulletin*, *134*(3), 383–403. https://doi.org/10.1037/0033-2909.134.3.383

Valenza, E., Simion, F., Cassia, V. M., & Umiltà, C. (1996). Face preference at birth. *Journal of Experimental Psychology: Human Perception and Performance*, *22*(4), 892–903. https://doi.org/10.1037/0096-1523.22.4.892

Van de Vondervoort, J. W., & Hamlin, J. K. (2016). Evidence for intuitive morality: Preverbal infants make sociomoral evaluations. *Child Development Perspectives*, *10*(3), 143–148. https://doi.org/10.1111/cdep.12175

Woo, B. M., Tan, E., & Hamlin, J. K. (2022). Human morality is based on an early-emerging moral core. *Annual Review of Developmental Psychology*, *4*, 41–61. https://doi.org/10.1146/annurev-devpsych-121020-023312

Wronski, C., Hernik, M., & Daum, M. M. (2022). Prior action direction of a novel agent cues spatial attention in 7-month-old infants. *Swiss Psychology Open*, *2*(1), 6. https://doi.org/10.5334/spo.38

Wynn, K., Bloom, P., Jordan, A., Marshall, J., & Sheskin, M. (2018). Not noble savages after all: Limits to early altruism. *Current Directions in Psychological Science*, *27*(1), 3–8. https://doi.org/10.1177/0963721417734875

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