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That Baby Caught My Eye . . . and the Effect Replicated: Infant Face Attention Capture Without Moderation by Pre-Parental Readiness

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Previous research has suggested that infant faces capture adult attention, and this effect has been interpreted as reflecting the biological salience of infant faces as positively valenced stimuli, to which humans may have evolved to respond preferentially. However, subsequent studies have not consistently replicated this phenomenon. The present study investigated attentional capture by infant faces in a sample of university students, while controlling for relevant covariates, including parental readiness and the perceived attractiveness of infant faces. The results confirmed the attention-capturing effect of infant faces; however, no significant effects of pre-parental readiness or infant facial attractiveness were observed.

Keywords
infant face, attention capture, pre-parental readiness, cuteness

Introduction

Over the course of evolution, humans have developed perceptual systems that automatically orient attention toward biologically and socially salient stimuli (Kaskan et al., 2022). For instance, experimental studies have shown that snakes (Öhman et al., 2001, but see Shibasaki, 2017) and emotional facial expressions (Sawada & Sato, 2015) can capture human attention. Among such stimuli, infant faces have also been reported to elicit attentional capture in adults (Brosch et al., 2007). In that study, attentional bias was assessed using the dot-probe paradigm (Lipp & Derakshan, 2005). When cue position was taken into account, detection of the subsequent dot was found to be facilitated only when the infant face was presented on the left side. This finding has been interpreted from an evolutionary perspective, whereby sensitivity to infantile cues promotes caregiving motivation and, ultimately, fitness.

However, the attentional capture effect of infant faces has not been replicated consistently (Koremura, 2015; Nittono, 2019; Shinohara & Moriguchi, 2012). Such replication failures may reflect variation in the perceived attractiveness of infant faces as well as individual differences among participants. For example, infant faces judged to be cuter have been shown to elicit stronger caregiving motivation in adults (Glocker et al., 2009). In addition, adults with higher pre-parental readiness appear to be more sensitive to the cuteness of infant faces (Ikeda, 2024). The present study therefore examined the replicability of the attentional capture effect of infant faces by employing infant-face stimuli with standardized levels of cuteness and by incorporating participants' pre-parental readiness into the analysis.

Methods

Participants

Twenty Japanese university students (10 females; *M* age = 21.3 years, *SD* = 1.49) participated in the experiment. The sample size was determined on the basis of the effect size reported in the original study (partial $\eta^2 = .14$), assuming $\alpha = .05$ and statistical power of .80 in a repeated-measures design, which yielded an estimated required sample of 22 participants (Faul et al., 2007). As described below, the present study employed a within-subjects design comprising 432 trials. Given that reaction-time measures in such designs are typically characterized by substantial within-subject correlations, a sample size of 20 participants was considered sufficient to retain adequate statistical power.

Materials

For the infant-face stimuli, six highly attractive faces and six low-attractiveness faces were selected from the standardized infant face dataset developed by Nittono et al. (2022). For the adult-face stimuli, six neutral faces (three male and three female) were drawn from the AIST Facial Expression Database 2017 (Fujimura & Umemura, 2018). Participants' pre-parental readiness was assessed using the scale developed by Shimizu et al. (2014).

Procedure

Participants completed the experiment individually in a university laboratory. Stimuli were presented using PsychoPy (version 2021.1.2), and the viewing distance was maintained at 60 cm. The experiment comprised a total of 432 trials, with participants allowed to take a break after every 144 trials. Each trial began with a 200-ms blank screen, followed by the presentation of a fixation symbol at the center of the screen for 500 ms. Next, an infant face and an adult face were presented side by side for 300 ms, after which a target dot appeared on either the left or right side of the screen for 200 ms. Subsequently, only the fixation point remained on the screen until a

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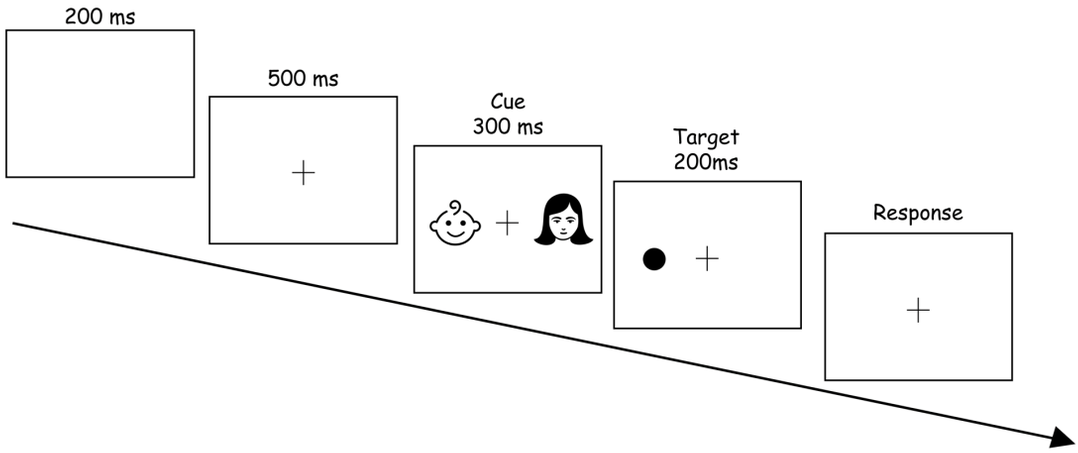
Figure 1
Experimental procedure (example: a condition in which both the infant face and the target were presented on the left)



response was made. Participants were instructed to press the key corresponding to the location of the dot (F or J key) as quickly and accurately as possible (Figure 1). The experiment included 144 valid trials, in which the dot appeared in the location previously occupied by the infant face, 144 invalid trials, in which the dot appeared in the location previously occupied by the adult face, and 144 neutral trials, in which no dot was presented. In the neutral condition, participants were instructed to press the spacebar instead of the F or J key. After completing all trials, participants responded to the Pre-Parental Readiness Scale (Shimizu et al., 2014) on a tablet device.

Results

Table 1 presents the mean accuracy rates and reaction times for each condition. In the analyses reported below, only the principal findings are described in detail; the complete results are available on the Open Science Framework. First, with respect to accuracy, an analysis of covariance (ANCOVA) was conducted with gender (male, female) as a between-subjects factor, cuteness (cute, less cute), cue position (right, left), and cue–target congruency (congruent, incongruent) as within-subjects factors, and pre-parental readiness as a covariate. The results revealed that only the interaction between pre-parental readiness and congruency was significant ($F(1, 16) = 11.685$, $p = .004$, $\eta_p^2 = .422$), whereas no other main effects or interactions reached significance ($ps > .05$). To further examine the Pre-Parental Readiness × Congruency interaction, a simple slope analysis of congruency was conducted after dividing participants into low and high pre-parental readiness groups; however, no significant effects were observed in either group ($ps > .05$). In addition, following Simmons et al. (2011), an ANOVA was conducted without including pre-parental readiness as a covariate, but again no main effects or interactions reached significance ($ps > .05$).

Next, a similar analysis of variance was conducted for reaction times. The results revealed a significant main effect of congruency ($F(1, 16) = 4.737$, $p = .045$, $\eta_p^2 = .228$), a significant interaction between pre-parental readiness and congruency ($F(1, 16) = 6.161$, $p = .025$, $\eta_p^2 = .278$), and a significant three-way interaction among pre-parental readiness, congruency, and cuteness ($F(1, 16) = 5.053$, $p = .039$, $\eta_p^2 = .240$). No other main effects or interactions reached significance ($ps > .05$). To examine the interaction among pre-parental readiness, congruency, and cuteness, participants were divided into low and high pre-parental readiness groups, and simple slope analyses were conducted for each combination of congruency and cuteness; however, no significant effects were found in any condition ($ps > .05$). Similarly, an ANOVA on reaction times was conducted without including pre-parental readiness as a covariate. In this analysis, only the main effect of congruency was significant ($F(1, 18) = 4.703$, $p = .044$, $\eta_p^2 = .207$), indicating that reaction times were significantly shorter in the congruent condition than in the incongruent condition. Therefore, as a supplementary analysis, the correlation between mean reaction time in the congruent condition and pre-parental readiness was calculated, but this association was not significant ($r(18) = -.175$, $p = .460$).

Discussion

This study examined the replicability of previous findings reported by Brosch et al. (2007), which suggested that infant faces capture adult attention. To do so, the present study incorporated participants' gender and pre-parental readiness as covariates, in addition to testing the effect of presentation location described in the original study. The results showed that, although no attention-capturing effect was observed in the analysis of correct response rates, reaction times were faster for targets appearing in the same location as the infant face, thereby confirming an attention-capturing effect. Neither the left–right presentation position, the attractiveness of the infant face, nor participants' pre-parental readiness modulated this attentional capture by infant faces.

This study supported the findings of Brosch et al. (2007) and extended them by demonstrating that the presentation position was not limited to the left. Regarding the attention-capturing effect of infant faces, there have been

Table 1
Mean accuracy rates and response times for each condition

Conditions				Accuracy		Response time	
sex	cuteness	cue	target	*M*	*SD*	*M*	*SD*
female	cute	left	congruent	0.964	0.044	0.181	0.045
			incongruent	0.975	0.024	0.188	0.022
		right	congruent	0.969	0.038	0.181	0.032
			incongruent	0.975	0.031	0.182	0.021
	uncute	left	congruent	0.953	0.047	0.174	0.030
			incongruent	0.978	0.022	0.185	0.027
		right	congruent	0.981	0.019	0.174	0.028
			incongruent	0.964	0.061	0.181	0.022
male	cute	left	congruent	0.986	0.027	0.205	0.078
			incongruent	0.986	0.035	0.196	0.050
		right	congruent	0.986	0.027	0.198	0.058
			incongruent	0.961	0.037	0.211	0.056
	uncute	left	congruent	0.978	0.037	0.194	0.055
			incongruent	0.975	0.036	0.203	0.060
		right	congruent	0.975	0.053	0.197	0.054
			incongruent	0.972	0.026	0.206	0.055

reports that failed to replicate these findings (Koremura, 2015; Nittono, 2019; Shinohara & Moriguchi, 2012), and since the effects of presentation location were inconsistent in both this study and Brosch et al. (2007), this attention-capturing effect may not be robust but rather fragile. However, this variability in the capturing effect could not be explained by participants' parental readiness or the attractiveness of the infant faces. Psychological research is considered particularly susceptible to publication bias, where only significant results tend to be published (Fanelli, 2010). Therefore, future research should review a broad range of reports—including studies that did not observe an attention-capturing effect of infant faces—to elucidate the factors explaining this variability.

The perception of infant faces as cute has been discussed from an evolutionary perspective as a trigger for caregiving behavior (Alley, 1980). However, although infant faces may serve an evolutionary function by eliciting caregiving motivation through their cuteness (Glocker et al., 2009), the existence of an attention-capturing effect does not necessarily indicate that this attentional bias itself emerged through evolutionary processes. If the attention-capturing effect of infant faces is acquired through some form of learning, variability across studies in terms of stimulus presentation location or the presence versus absence of the effect would not be unexpected. Therefore, further research involving younger age groups prior to adulthood is needed to clarify the developmental processes underlying attentional capture by infant faces from both phylogenetic and ontogenetic perspectives.

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Author contribution
Shinnosuke Ikeda: Conceptualization, Methodology, Software, Validation, Formal analysis, Investigation, Resources, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Project administration, Funding acquisition.

Ethical statement
The study was approved by the Institutional Review Board of the authors' affiliated institution at the time of the experiment (Approval No. 2023-18). All participants provided written informed consent prior to participating, and the study was conducted in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Data accessibility & program code
The dataset and analysis code used in this study are available on the Open Science Framework (https://doi.org/10.17605/OSF.IO/ZN5PE).

Supplementary material

Detailed analysis results are available as supplementary materials on the Open Science Framework at the above link.

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