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Viewing Cute Images Increases Behavioral Carefulness

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Infantile physical morphology—marked by its "cuteness"—is thought to be a potent elicitor of caregiving, yet little is known about how cuteness may shape immediate behavior. To examine the function of cuteness and its role in caregiving, the authors tested whether perceiving cuteness can enhance behavioral carefulness, which would facilitate caring for a small, delicate child. In 2 experiments, viewing very cute images (puppies and kittens)—as opposed to slightly cute images (dogs and cats)—led to superior performance on a subsequent fine-motor dexterity task (the children's game "Operation"). This suggests that the human sensitivity to those possessing cute features may be an adaptation that facilitates caring for delicate human young.

Keywords: cuteness, nurturance, care, fine-motor skill

Humans are highly attuned to the physical features that characterize their young, such as a large rounded forehead, large low-set eyes, and a small chin (Alley, 1981, 1983a; Huckstedt, 1965). Those who possess these features are deemed "cute" and are the object of a variety of nurturing and affectionate impulses, such as high-pitched vocalizations (i.e., "baby talk"; Spindler, 1961; Zebrowitz, Brownlow, & Olson, 1992), preferential looking (Hildebrandt & Fitzgerald, 1981), leniency (McCabe, 1988), and protectiveness (Alley, 1983b). This research suggests that the tendency to respond emotionally to infantile physical features may promote the provision of care, especially to infants, who are otherwise helpless due to their physical and neural immaturity. However, the exact ways in which cuteness may enhance care are not yet fully understood. Cuteness might simply and only strengthen adults' emotional attachments to infants, thereby increasing their willingness to care for them. Alternatively, the affective "cute response" may include a behavioral component that facilitates caregiving itself. Because caring for a small, delicate child requires one to act with great care, we reasoned that cuteness cues might stimulate increased attention to, and control of, motor behavior. We therefore predicted that seeing cuteness will increase behavioral carefulness. In two experiments, we tested this prediction by having participants view a slide show that contained images of animals. We varied the age—and thus cuteness—of the animals experimentally (varying the age of animals depicted in photographs influences perceived cuteness across a range of species, including dogs and cats; Sanefuji, Ohgami, & Hashiya, 2007). Because high levels of carefulness seem more critical for fine-motor movements (e.g., brain surgery) than for gross-motor movements (e.g., running), we used performance on a fine-motor dexterity task as an index of behavioral carefulness.

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Standard laboratory dexterity tasks score performance as the number of objects successfully moved per second. Because cuteness may not make people faster (only more careful), we used a similar task that was not time dependent: the classic children's game "Operation" (Hasbro, Pawtucket, RI), in which participants use tweezers to remove small objects (body parts) from confined spaces. This task is similar to standard fine-motor dexterity tasks (e.g., the O'Connor tweezer dexterity task, Lafayette Instrument, Lafayette, IN), but performance can be quantified without reference to speed. Because positive actions directed toward a child likely require physical gentleness, we also used a grip-strength gauge as a measure of physical weakness/gentleness.

In addition, during the viewing of the slide show we monitored heart rate and electrodermal responding. This allowed us to (a) detect changes in autonomic physiology that might facilitate fine-motor coordination, and (b) to assess whether any shifts in behavior can be attributed to general physiological arousal. Finally, given that responsiveness to cuteness may be rooted in maternal caregiving, and given that women are generally more responsive to cuteness than are men (e.g., they smile more at cute children; Hildebrandt & Fitzgerald, 1978), we tested only women in Experiment 1. In Experiment 2, we tested both men and women.

Several factors entered into our choice of images to use as stimuli in these experiments. Some studies of cuteness have used simple schematic drawings as stimuli (e.g., Alley, 1983b). This approach allows for the manipulation of the size and proportion of specific craniofacial features (e.g., eye size), but the stimuli tend to be relatively weak as emotion elicitors. When assessing self-report outcomes (e.g., hypothetical willingness to defend the child), this may not be problematic. Given our interest in manipulating carefulness, however, we believed that more powerful stimuli were necessary. We used photographs of real animals, young and mature.

Experiment 1

Method

Participants. Forty University of Virginia undergraduate women participated for partial course credit (mean age = 18.46).

Participants were randomly assigned to one of two conditions (low cuteness or high cuteness).

Stimuli. The slide show consisted of three sections, each with nine images. The first (baseline) and third (post) sections featured neutral images of house interiors and were identical in content across conditions. The middle (main) section featured images of animals—either puppies and kittens (high cuteness) or dogs and cats (low cuteness), depending on condition. Each image was presented for 10 s, with a 3-s black screen providing a transition between images.

We validated the main stimuli by having an independent sample ($N = 17$) rate the images on cuteness and interestingness using 6-point scales ranging from 0 (*not at all*) to 5 (*extremely*). Compared to the low-cuteness images, the high-cuteness images were considered cuter ($M = 3.98$ vs. $M = 1.37$), $t(16) = 15.21$, $p < .001$, and more interesting ($M = 2.44$ vs. $M = 1.77$), $t(16) = 3.35$, $p < .01$.

Measures. A Biopac MP100 System (Biopac Systems, Goleta, CA), sampling at 1,000 Hz, was used for physiological data acquisition. An electrocardiogram (ECG) measured heart activity via three general purpose electrodes attached to each participant (Lead 1 configuration). Acqknowledge 3.7.2 software (Biopac Systems, Goleta, CA) extracted interbeat intervals (IBIs), which were then visually inspected and manually corrected for artifacts. An absolute measurement of skin conductance level (SCL) was obtained by placing two electrodes on the volar surface of the medial phalanges of the first and third fingers of the nondominant hand. We used Redux Electrolyte Paste (Parker Laboratories, Fairfield, NJ) as a conductant. To compute the change in heart rate (HR) and SCL from baseline to the main section, we computed mean HR and SCL levels for these sections using CMet Software (for HR; Allen, 2002; available from http://apsychoserver.psych.arizona.edu) and Acqknowledge 3.7.2 software (for SCL).

A slide show after the questionnaire assessed emotional impact ("How much did this slide show affect you emotionally?"), physical impact ("How much did this slide show affect you physically?"), and peak intensity of specific emotions (happiness, entertainment, amusement, calmness, tenderness, sadness, fear, and surprise) on a 6-point scale ranging from 0 (*not at all*) to 5 (*extremely*). At the end of the experiment, participants used the same 6-point scale to rate the cuteness and interestingness of the animal slide show. In addition, mood was assessed at the beginning of the experiment and after the slide show using a 100-point scale ranging from 1 (*the worst I have ever felt*), to 100 (*the best I have ever felt*).

In the operation task, the participant used a pair of tweezers to remove various small plastic body parts from the "patient" without touching the tweezers to the sides of each compartment. Participants had one chance to remove each of 12 body parts, and performance was scored as the number of body parts successfully removed. Finally, grip strength was measured using a hand dynamometer.

Procedure. The experimenter told participants (who were run individually) that their physiology would be monitored while they performed several tasks. After a partial hookup was complete (ECG was not attached yet to keep participants' dominant hand free for the behavioral tasks), participants were given the hand dynamometer and asked to squeeze it as hard as possible. Participants then played the Operation game while the experimenter observed unobtrusively and recorded their scores. Next, the ECG was attached and participants moved to the viewing chamber (a separate area of the experiment room, enclosed by a curtain), were seated, and watched the slide show on a projection screen. Afterward, the ECG was removed. Participants then squeezed the hand dynamometer again, completed the questionnaire, and then played the Operation game once again. Participants then answered the final two self-report items.

Results and Discussion

The means for all self-report variables are presented in Table 1, along with the results of *t* tests of the difference in the mean for each item as a function of condition. The most intensely experienced emotions—happiness, calmness, tenderness, amusement, and entertainment—were experienced more intensely in the high-cuteness condition than in the low-cuteness condition (ps $< .05$ for all except calmness, for which $p < .10$) and the high-cuteness slide show was rated as more interesting and cuter than the low-cuteness slide show (ps $< .05$).

The mean change for each behavioral and physiological variable as a function of condition is presented in Table 2. As predicted, cuteness increased performance on a subsequent task requiring extreme carefulness: participants showed significantly greater improvement in performance (from before to after the slide show) on the operation task in the high-cuteness condition than in the low-cuteness condition, $t(38) = 1.99$, $p = .05$, $d = 0.63$. Contrary to predictions, the manipulation of cuteness did not influence change in grip strength ($t < 1$). HR did increase more in the high-cuteness condition ($M = 1.64$) than in the low-cuteness condition ($M = .02$), $t(37) = 1.89$, $p = .07$, $d = 0.61$, but no effect of cuteness on change in SCL was observed ($t < 1$).

Because the stimuli used in the two conditions differed on a variety of dimensions beyond cuteness (e.g., interestingness, positivity), we examined the correlations between change in operation performance and the self-report variables. Change in performance was positively correlated with ratings of cuteness ($r = .29$, $p = .07$) and self-reported intensity of tenderness ($r = .34$, $p < .05$) but not with ratings of interest ($r = .09$, $p = .60$) or intensity of happiness, amusement, entertainment, calmness, sadness, or surprise (rs between $-.07$ and .16, ps $> .33$). This pattern suggests that the effect of cuteness on participants' carefulness in executing fine-motor movements was likely due to the images' cuteness and tenderness-inducing qualities rather than their general positivity or interestingness.

Experiment 2

In Experiment 1, viewing images of puppies and kittens enhanced fine-motor performance, supporting the hypothesis that cuteness increases behavioral carefulness. Although the pattern of correlations suggests that cuteness was the critical dimension responsible for this effect, the images differed on several dimensions, precluding us from ruling out other extraneous influences (e.g., positive affect). In Experiment 2, we aimed to replicate the main finding of Experiment 1 (that cuteness increased carefulness) with two entirely new sets of stimuli that were pretested to match across conditions in the levels of positive affect and interest they evoked. This matching allows us to isolate the effect of cuteness

Table 1
Means (SE) for Self-Report Items by Experiment and Condition

	Experiment 1			Experiment 2		
Variable	Low cute	High cute	*p*	Low cute	High cute	*p*
General						
Emotional impact	1.35 (.21)	2.40 (.23)	.002	2.14 (.27)	1.54 (.23)	.09
Physical impact	.40 (.15)	.65 (.21)	.34	.93 (.24)	1.00 (.19)	.81
Change in mood	−.79 (2.21)	6.29 (1.88)	.02	4.12 (1.49)	2.54 (1.63)	.48
Emotion						
Happiness	1.75 (.34)	3.60 (.27)	<.001	2.82 (.28)	2.71 (.30)	.79
Calmness	2.45 (.36)	3.40 (.37)	.07	3.00 (.33)	3.57 (.24)	.17
Tenderness	1.30 (.31)	2.55 (.39)	.02	2.04 (.29)	2.54 (.30)	.23
Amusement	.85 (.21)	2.30 (.31)	<.001	2.14 (.29)	2.29 (.31)	.74
Entertainment	.60 (.21)	1.90 (.36)	.003	1.39 (.24)	1.29 (.27)	.77
Surprise	.60 (.22)	.60 (.27)	1.00	.75 (.19)	.43 (.17)	.22
Sadness	.50 (.19)	.55 (.27)	.88	.50 (.19)	.43 (.14)	.76
Fear	.20 (.12)	.10 (.10)	.52	.46 (.16)	.21 (.12)	.21
Ratings						
Interesting	1.75 (.25)	2.60 (.31)	.04	2.57 (.27)	2.50 (.27)	.85
Cute	3.15 (.27)	4.75 (.10)	<.001	3.07 (.31)	4.29 (.20)	.002

Note. Ratings were given on 6-point scale, ranging from 0 (*not at all*) to 5 (*extremely*). p = result of t test of difference in means between conditions.

from these factors that may alter fine-motor performance independently. We also included male participants to test whether the effect of cuteness on carefulness was specific to women.

Method

Participants. Fifty-six University of Virginia undergraduates participated for partial course credit (23 women, 33 men; mean age = 18.80). We tested for, and report, any main or interactive effects of gender.

Stimuli. Because the two sets of stimuli used in Experiment 1 differed on more dimensions than cuteness, we created a new low-cuteness image set that included more interesting dog images as well as several images of lions and tigers. Although this expands the range of animals to include more exotic felines (that are rarely kept as pets), this was necessary to achieve a level of interest, emotional power, and positivity similar to that of the puppy and kitten images. In addition, to enhance the generalizability of any findings, we used a new set of puppy and kitten images. An independent sample (N = 12) assessed the following dimensions: cute, interesting, enjoyable, and exciting using 6-point scales ranging from 0 (*not at all*) to 5 (*extremely*). Compared to the low-cuteness images, the high-cuteness images were rated as being cuter (M = 4.43 vs. M = 2.86), $t(16) = 9.23$, $p < .001$. The two sets of images, however, were equally interesting (M = 3.37 vs. M = 3.50), equally enjoyable (M = 3.67 vs. M = 3.40), and equally exciting (M = 1.55 vs. M = 1.89) (all $ts < 1.63$, $ps > .12$).

Measures and Procedure. The measures and procedure of Experiment 2 were identical to those of Experiment 1, except for one minor change: after the slide show, completion of the questionnaire followed playing the Operation game. This change was made to rule out the possibility that the effect of cuteness on carefulness in Experiment 1 was due to the secondary act of reflecting on, and writing about, one's emotional experience (of tenderness and other emotions) rather than the primary act of viewing the images.

Table 2
Mean Difference Scores (SE) for Physiological and Behavioral Variables by Experiment and Condition

	Experiment 1			Experiment 2		
Variable	Low cute	High cute	*p*	Low cute	High cute	*p*
Change in:						
Operation	.60 (.44)	1.80* (.41)	.05	.46 (.29)	1.32* (.33)	.05
Grip strength	−3.35 (1.56)	−4.35 (2.33)	.72	1.93 (1.31)	2.43 (1.16)	.78
HR	.02 (.46)	1.64* (.72)	.07	.73* (.35)	1.17† (.63)	.54
SCL	−.79* (.15)	−.67* (.21)	.64	−.76* (.18)	−.59* (.15)	.48

Note. Operation measured in body parts (maximum = 12). Grip strength was measured in pounds per square inch. Heart rate (HR) was measured in beats per minute. Skin conductance level (SCL) was measured in micromhos. p = significance level for test of whether difference scores varied by condition (independent-samples t test). Difference scores marked with a symbol differed significantly from zero (one-sample t test).
* $p < .05$. † $p < .10$.

Having participants wait to report on their emotional experience until after the fine-motor dexterity task allowed our carefulness measure to immediately follow the viewing of the images.

Results and Discussion

The means for all self-report variables are presented in Table 1, along with the results of *t* tests of the difference in the mean for each item as a function of condition. The two sets of stimuli used were nearly identical except for the critical dimension of cuteness. Notably, the two conditions did not differ on change in mood or on any specific emotion. This was true even of tenderness—an emotion putatively related to cuteness—although the difference between the means was in the predicted direction.[1] This means that the two slide shows were matched on the degree to which they elicited positive affect. Therefore, our cuteness manipulation was effective in isolating the specific effect of cuteness from the more general potential influences of positive emotion or mood. In addition, it is noteworthy that our inclusion of several lion and tiger images as low-cuteness stimuli did not amplify any negative emotions. For example, the self-reported intensity of fear did not differ by condition and was extremely low in both conditions.

The mean change of each behavioral and physiological variable as a function of condition is presented in Table 2. Replicating the main finding of Experiment 1, participants showed significantly greater improvement on the operation task in the high-cuteness condition than in the low-cuteness condition, $t(54) = 1.97$, $p = .05$, $d = 0.48$. Although there was a trend for women ($d = 1.03$) to show a larger effect of condition than men ($d = 0.24$), this was not statistically significant: Gender × Condition interaction, $F(1, 52) = 1.36$, $p = .25$. As in Experiment 1, cuteness did not affect change in grip strength ($t < 1$). Unlike in Experiment 1, in which cuteness was associated with increased HR, neither change in HR nor change in SCL differed by condition (ts < 1). Together, this pattern makes it unlikely that the observed effect of cuteness on operation performance was due to general physiological arousal. Although change in HR did not differ by condition, it increased slightly in both conditions, perhaps because viewing pictures of animals (whether high or low in cuteness) triggers excitement and an approach orientation.

Unlike in Experiment 1, change in operation performance was not significantly related to any self-report items (rs between $-.13$ and .19, ps $> .15$). The failure to replicate the relationship between self-reported tenderness and behavioral carefulness found in Experiment 1 may have been due to the longer delay in Experiment 2 between the slide show and completion of the questionnaire. The further self-report emotional assessments get from the event in question, the more people's responses tend to reflect their beliefs about emotion rather than emotion itself (Robinson & Clore, 2002a, 2002b). Thus, self-reports of tenderness in Experiment 2 may have been less indicative of the intensity of experienced tenderness than those obtained in Experiment 1.

General Discussion

In two experiments, we found that exposure to images of young, cute animals (kittens and puppies) increased performance on a task that demanded extreme carefulness in order to successfully execute finely tuned motor movements (the children's game Operation), an effect that cannot be attributed to general positivity (e.g., mood or specific positive emotion) or arousal (measured via self-report and autonomic physiology). This behavioral shift toward increased carefulness makes sense as an adaptation for caring for small children, and is consistent with the view that cuteness is a releaser of the human caregiving system (Lorenz, 1950/1971). Moreover, this finding suggests that cuteness does not just influence one's willingness to engage in caregiving behaviors but also influences the ability of one to do so. That is, cuteness not only compels us to care for cute things but also prepares us to do so via its effects on behavioral carefulness.

This finding fits nicely with the embodied cognition perspective that emphasizes the way affective states are constrained by, and expressed in, the body (Barrett & Lindquist, 2008). Our finding suggests that the tenderness elicited by something "cute" is more than just a positive affective feeling state—it can literally make people more physically tender in their motor behavior. Research has demonstrated an ideomotor effect whereby the processing of positive stimuli facilitates pulling a lever, the basic motor behavior involved in pulling desired objects closer (presumably reflecting a behavioral predisposition for approach; Chen & Bargh, 1999; Rotteveel & Phaf, 2004). The current finding may be a novel manifestation of the extension of this effect beyond simple valence-approach/avoid relationships. Having a specific kind of positive affective orientation toward an object (finding it cute and experiencing tender feelings) can influence the specific kind of motor actions one is prepared to make (careful, tender movements).

Contrary to predictions, cuteness did not make people any weaker, at least as we measured it. It is possible that had we not instructed participants to squeeze as hard as possible (which may have amplified variance associated with trait strength and limited variance associated with state strength), that cuteness would have had a noticeable effect. That is, cuteness may not make people physically weaker but may make them less willing to exert their full strength. Another concern is that grip strength is often used as a measure of motivation. If cuteness triggered an approach-oriented motivational state this may have counteracted any shift toward gentleness.

This is the first investigation to document that immediate shifts in carefulness—indexed here by fine-motor performance—can be elicited by cuteness cues. This suggests that two factors—the importance of physical contact in early mammalian development and the extremely delicate nature of human young—may have exerted evolutionary pressures favoring those who could respond to the presence of cues colloquially described as "cute" with increased carefulness.

[1] Women reported more tenderness and sadness and rated the images as cuter and more interesting, regardless of condition, than did men.

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