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Original Article

Strategic Reactions to Infants: Female Self-Presentation in a Romantic Context

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Abstract: Research has demonstrated that humans engage in various self-presentational behaviours in the context of mate attraction. We build and expand on these efforts by showing that female facial behaviour also responds to the manipulation of romantic motivation in ways congruent with the logic of evolutionary theory. Given that childbearing is an important goal of human courtship, we hypothesized that during the initial stages of romantic encounters one way that women can advertize their quality is through their emotional reactions to children. Two studies were conducted to determine whether women would self-present in the context of romance by augmenting positive reactions (e.g., smiling more) or by attenuating negative reactions (e.g., frowning less). In both studies participants were undergraduate psychology students. Study 1 was an online study; it examined reported facial expressions towards and cognitive evaluations of infants. Study 2 was a laboratory study in which participants' spontaneous facial behavior was videotaped while they watched a video of infants (vs. a neutral film). In both studies we found support only for the hypothesis that, when in a romantic context, women attenuate negative reactions. Such attenuation was found for facial expressions, but not for cognitive or affective evaluations of infants.

Keywords: emotion, facial expressions, FACS, mate attraction, nonverbal behaviour, strategic communication

Introduction

Successful reproduction is one of the most important goals of the existence of any living organism, and humans are no exception to this (Symons, 1979). Evolutionary theory holds that humans will selectively assort themselves with members of the opposite sex who possess traits that have been associated with successful reproduction over our evolutionary history (sexual selection; Darwin, 1859). Directly or indirectly, these traits have been selected for because of their beneficial influence on the likelihood that offspring would

survive and reproduce themselves. For example, according to this logic, female youth is valued (Feingold, 1990) because young women are able to bear more children (Buss, 2007). Because infants are the focus of human reproductive efforts, it seems reasonable to expect that, in the context of the initiation of certain types of romantic relationships, one of the ways humans will advertize their quality is through their emotional reactions to infants. The focus of the current research is whether or not women advertize their quality in such a way within the context of romance.

In humans, the young are not initially able to lead independent lives, so they rely on parental care for food and protection. This dependency puts a selective pressure on parents to be affectionate enough to provide for their offspring (MacDonald, 1992), which in turn provides a fertile ground for self-presentation, such that persons are likely to be motivated to strategically modify their emotional reactions to children in the presence of potential partners. Normal parenting, of course, involves expressions of both positive and negative emotions, so it is important to note that we are not arguing that persons who express negative feelings towards children necessarily are or will be bad parents, or that persons who express positive feelings towards children necessarily are or will be good parents. What we propose is that in the context of long-term romance, where one's stance towards children is relevant, concerned parties will be motivated to make a statement about their *typical* reaction to children by modifying their emotional reactions towards them.

Two hypotheses about female self-presentation vis-à-vis infants can be derived from the above (for the way males self-present vis-à-vis infants in the context of mate attraction, see Dosmukhambetova and Manstead, 2012). First, *in the context of romance, women might advertize the fact that they are likely to be good mothers by projecting more affection towards infants than they do in a neutral context* (Hypothesis 1). Second, *in the context of romance, women might advertize the fact that they are unlikely to be poor mothers by attenuating negative reactions towards infants more than they do in a neutral context* (Hypothesis 2). Although these are the two conceptually distinguishable possibilities, they are not equally likely to be supported by empirical evidence. There are good reasons to believe that if women do indeed advertize their mothering qualities through their behaviour towards infants when in the presence of potential romantic partners, they will do so by attenuating negative expressions, rather than augmenting positive expressions.

One reason is that the pressure to be affectionate to infants is likely to act more strongly on women, because their reproductive success is limited by the number of children they can raise to maturity (Trivers, 1972), which means that there may be relatively little variation in this trait for women. Thus men might assume that women *would* be affectionate towards children unless proven otherwise, which in turn would imply that women do not need to expend effort in showing that they are affectionate. There is nevertheless at least some variation in feeling affection towards infants, as evidenced by the fact that mothers are the most likely perpetrators of non-sexual parental violence towards children (Cawson, Wattam, Brooker, and Kelly, 2000), and mothers commit infanticide as often as fathers (U.S. Department of Justice, 2011). Such lack of affection towards children on the part of women would severely limit male reproductive success; this implies that men should prefer women who do not express negative emotions towards children.

Another reason that women are more likely to advertize their mothering quality by avoiding being seen as potentially poor mothers is that the relevant self-presentation would,

by definition, take place before any offspring resulting from the relationship are born, which means that the infants involved in self-presentational behaviours would be any infants in the environment of a woman who is motivated to attract a long-term partner. Strictly speaking, a good mother needs to be affectionate only to her own children and it might even be evolutionarily costly (and therefore possibly unattractive to potential partners) for women to show propensity to be too affectionate to unrelated infants.

In this study we are interested in how and whether these dynamics play out through *emotional facial expressions* directed at infants. In past decades, students of emotion have accumulated substantial evidence that various emotion-related behaviors are responsive to changes in social settings (Ekman, 1972; Fridlund, 1994; Friesen, 1972; Wagner and Lee, 1999). Despite this trend, there has been relatively little research investigating how *emotional expressions* are used strategically to achieve specific social goals (Clark, Pataki, and Carver, 1995; Evers, Fischer, Rodriguez Mosquera, and Manstead, 2005), with only a small minority of these investigating actual facial expressions (e.g., Buss and Kiel, 2004) and only a handful (e.g., Dosmukhambetova and Manstead, 2012) examining strategic facial behavior using Facial Action Coding System (FACS; Ekman, Friesen, and Hager, 2002), a standardized system for coding facial behavior, which we use in Study 2 of the present research.

We conducted two studies to test the proposed hypotheses. Both were approved by the Cardiff University School of Psychology Ethics Committee. In Study 1 (an online study), we manipulated the positivity and negativity of questions we asked about an infant while female participants were in either a romantic or a neutral mindset. This enabled us to examine whether a romantic (vs. neutral) mindset and the framing of questions (positive vs. negative) would jointly influence women's reactions to infants. Study 2 was a laboratory experiment in which we examined whether romantic context would affect participants' positive (smiling) and negative (frowning) nonverbal facial behavior (as measured by FACS) vis-à-vis infants.

We varied romantic context by using priming materials, rather than by exposing participants to an attractive male confederate in the laboratory. Making a type of audience salient in the minds of participants through priming is an established way of manipulating audience presence (e.g., Fitzsimons and Bargh, 2003; Fridlund, 1991), and an obvious advantage over manipulating the physical presence of various audiences is that it is much easier to standardize priming. Priming has been successfully used in prior research to manipulate romantic motivation and influence romance-related self-presentational behavior (e.g., Griskevicius, Goldstein, Mortensen, Cialdini, and Kenrick 2006; Roney, 2003, Wilson and Daly, 2004).

Study 1: Reported facial expressions

In this online study participants were primed with either a romantic or a control scenario and were then asked to answer questions about their likely facial expressions in response to an infant depicted in a photograph (our main DV of interest) as well as the physical attractiveness of the infant. In order to test whether participants would augment positive reactions or attenuate negative reactions, we framed our DVs using either positive or negative wording while keeping the semantic content of the questions similar. For

example, in one condition we asked participants how *cute* the infant was, while in the other condition we asked them how *ugly* he was.

For data analytic purposes, it is important to note that even though the questions were asked differently in the two framing conditions, the answers to these questions constitute a single variable. Another important point to keep in mind is that in the positive frame condition higher numbers mean greater positivity, while in the negative frame condition lower numbers mean greater positivity. Therefore, before any data analytical tools are applied, the data from one of the conditions need to be recoded in order to match the direction of positivity of the data in the other condition. Once the data are thus recoded, a standard factorial ANOVA can be performed.

Materials and Methods

Participants

Eighty-nine female students participated in this experiment in exchange for course credit. They were recruited from an established participant panel consisting of 1st and 2nd year undergraduate students of psychology and were given a deadline for accessing and completing the study. Their average age was 19.07 ($SD = 3.62$); 98% of the sample identified themselves as British, while the remaining 2% identified themselves as “Other.” In terms of ethnicity, 97% reported being White, 2% reported being Asian, and the rest reported being “Other.” Fifty-two per cent of the sample were single, 34% were in casual or steady dating relationships, and the rest were in serious committed relationships; none were married. Three per cent reported having at least one child. All participants reported being heterosexual.

Stimuli

A photograph was selected from the database of infant pictures developed by Van Duuren, Kendell-Scott, and Stark (2003). In pre-tests reported by Van Duuren et al. the selected infant received an average rating of 5.75 ($SD = 1.36$) on a 1 to 7 scale of attractiveness.

To prime romance, we used Griskevicius et al.’s (2006) materials. In the romance condition, participants read a story in which they meet a highly desirable person; the story depicts the progress of the romance that develops into a passionate, committed relationship. In the control condition, participants read a story in which they go to a much-anticipated concert with a friend; the story describes the protagonist being worried because of her inability to find the concert tickets but ends with her finding them and leaving the house feeling excited and happy. The control scenario was designed to match the experimental scenario with respect to its ability to engage readers.

Facial expressions

We measured facial expressions, our main DVs of interest, by asking participants to indicate how much they would frown or smile by sliding a cursor that animated a photographic image of a woman, changing the intensity of her facial expression from the complete absence of a smile or frown, at one endpoint, to a high intensity smile or frown, at the other. The anchor pictures (i.e., neutral and highest intensity) for these animations were taken from the Averaged Karolinska Directed Emotional Faces database developed by

Lundqvist and Litton (1998). The pictures we used were the “half right” versions, where the depicted person is seen in half profile, looking to the right of the camera. The intermediate pictures for the animations were created using morphing software (Morpheus Photo Morpher, v.3.01).

Whereas smiling is a straightforward representation of positive affect, the use of frowning to index negative affect warrants some comment. Frowning (AU4; Ekman et al., 2002) was chosen in preference to other “negative” expressions because in addition to being an expression that is appropriate for the situation with which participants were presented, we thought that participants would find it easier to answer questions about frowning than about components of the prototypical disgust expression (e.g., AU9 and AU10).

Procedure

After giving informed consent, participants read one of the two mindset scenarios (romantic or control) and answered manipulation check questions that probed the degree to which they visualized the scenario, and the degree to which they experienced happiness, excitement and romantic arousal (1 – not at all, 4 – moderately, 7 – extremely). They were then randomly assigned to one of the two framing conditions (positive or negative). In each case, they were presented with a picture of the infant and were asked to answer two questions. Specifically, participants were asked about the infant’s physical attractiveness (“How cute [ugly] is this infant?” Answers ranged from 1 – *not at all*, to 4 – *somewhat*, to 7 – *very much so*), and about their own facial expression in reaction to the infant (“How much would you smile [frown] if this infant behaved in naughty way?” Expressions ranged from 1 – *a neutral face*, to 7 – *an expression at maximum intensity*), as appropriate for the two framing conditions.

Design

The design of the study was a 2 (Mindset: romantic vs. control) x 2 (Frame: negative vs. positive) between-subjects design.

Data recoding

For reasons explained above, we recoded the negative frame variables by reversing the numbers and equating the midpoints of the relevant positive frame variables to the most positive score in the negative frame variables (i.e., 1 = 4, 2 = 3, 3 = 2... 7 = -2). For example, *somewhat cute* was equated with *not at all ugly*, and *not at all cute* was equated with *somewhat ugly*. Although there were other possible ways to recode the data, it is worth pointing out that the chosen method influences the main effect of frame but not the main effect of mindset or the interaction between mindset and frame, which were the effects in which we were interested.

Results

Manipulation check

A 2 (Mindset) x 2 (Frame) factorial ANOVA revealed that there was a significant main effect of mindset on the degree of romantic arousal participants experienced after reading each scenario, $F(1, 85) = 114.72, p < .0001, \eta^2 = 0.57$, such that participants in the

romantic mindset ($M = 4.82$; $SD = 1.42$) experienced more romantic arousal than participants in the control mindset ($M = 1.71$; $SD = 1.29$). The main effect of frame, $F(1, 85) = 0.64$, *ns*, and the interaction between mindset and frame, $F(1, 85) = 0.04$, *ns*, were not significant. The factorial ANOVA also revealed a significant main effect of mindset on the degree of happiness experienced by participants, $F(1, 85) = 4.68$, $p = .033$, $\eta^2 = .052$, such that participants in the romantic mindset ($M = 5.59$; $SD = 1.04$) experienced more happiness than participants in the control mindset ($M = 5.09$; $SD = 1.10$). The main effect of frame, $F(1, 85) = 0.86$, *ns*, and the interaction between mindset and frame, $F(1, 85) = 0.086$, *ns*, were not significant. Finally, the 2 (Mindset) \times 2 (Frame) factorial ANOVA did not reveal any main or interaction effects on the degree of excitement participants felt (smallest $p = .14$) or on how well participants were able to visualize the scenarios (smallest $p = .25$). Overall, we considered the mindset manipulation to be successful; however, as the main effect of mindset on happiness was unintended, we controlled for it in further analyses. Following the suggestion of Yzerbyt, Muller and Judd (2004), we also controlled for the interaction of happiness with frame type.

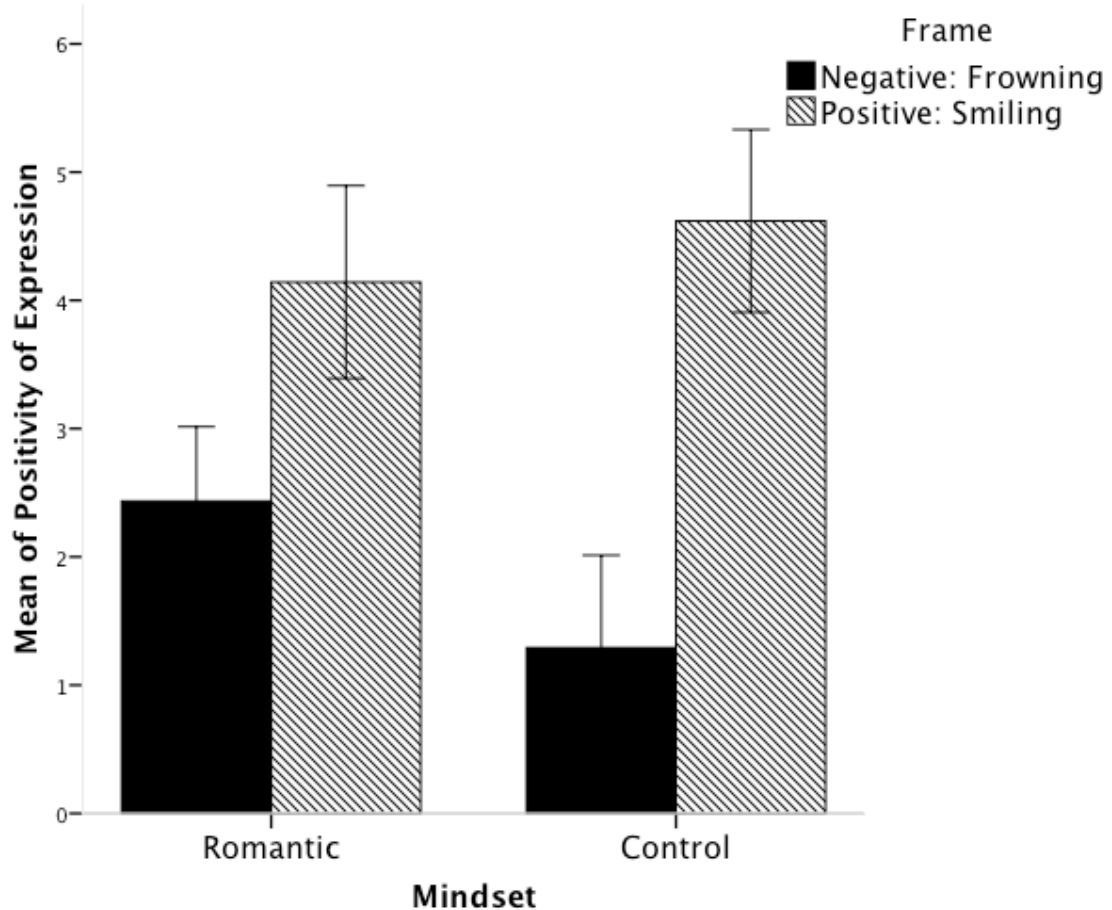
Physical attractiveness

A 2 (Mindset: romantic vs. control) \times 2 (Frame: negative vs. positive) factorial ANOVA with happiness and the interaction between frame type and happiness as covariates revealed that the interaction between mindset and frame on ratings of the infant's physical attractiveness ("how cute/ugly is this infant?") was not significant, $F(1, 83) = 2.93$, *ns*, $\eta^2 = .034$. There was also no main effect of mindset, $F(1, 83) = 0.004$, *ns*, $\eta^2 < .001$. However, there was a main effect of frame, $F(1, 83) = 78.96$, $p < .0001$, $\eta^2 = .49$, such that participants in the negative frame condition ($M = 3.28$; $SD = 0.95$) thought that the infant was less attractive than did participants in the positive frame condition ($M = 5.38$; $SD = 1.25$). Finally, happiness and the interaction between frame and happiness were not significant covariates ($ps > .16$), indicating that these variables did not affect the pattern of results.

Reported facial expressions

A 2 (Mindset: romantic vs. control) \times 2 (Frame: negative vs. positive) factorial ANOVA with happiness and the interaction between frame type and happiness as covariates revealed that there was a significant mindset-by-frame interaction on the positivity of facial expressions that participants would display if the infant were to behave in a naughty way, $F(1, 83) = 4.86$, $p = .030$, $\eta^2 = .055$ (see Figure 1). The simple effect of mindset was significant in the negative frame condition (frowning, $p = .025$), but not in the positive frame condition (smiling, *ns*). In other words, participants reported that they would frown less (but not that they would smile more) at the infant when they were in the romantic mindset ($M = 2.43$; $SD = 1.34$) than in the control mindset ($M = 1.29$; $SD = 1.71$). The main effect of frame, $F(1, 83) = 55.24$, $p < .0001$, $\eta^2 = .40$, was also significant, but there was no main effect of mindset, $F(1, 83) = 0.89$, *ns*, $\eta^2 = .011$. Finally, happiness and the interaction between frame and happiness were not significant covariates ($ps > .57$), indicating that these variables did not affect the pattern of results.

Figure 1. The effect of mindset and frame on reported facial expressions. Error bars: 95% CI. Note: higher scores reflect greater positivity, i.e., smiling more in the positive frame and frowning less in the negative frame



Discussion

There was a significant interaction effect of mindset and frame on reported facial behavior, such that when female participants were in a romantic mindset they reported that they would frown less, but not that they would smile more, in reaction to an infant. The interaction between mindset and frame was not found for evaluations of the infant's physical attractiveness. We also found large but theoretically uninteresting main effects of frame on evaluations of the infant's physical attractiveness and on reported facial expressions.

This study provides initial evidence that Hypothesis 2 (namely, that in a romantic context women would attenuate negative reactions to infants) is more tenable than Hypothesis 1 (namely, that under the same circumstances women would augment positive reactions to infants). However, the dependent measure was self-reported facial behavior and it is unclear whether the observed effect would generalize to spontaneous facial behavior. Another limitation is that there was no control for the infant stimulus; it is

conceivable that women have a generalized tendency to express less negative affect in a romantic context, rather than a specific tendency to express less negative affect towards children. Both limitations were addressed in Study 2, in which we brought participants into the laboratory in order to videotape their nonverbal behavior, and used a neutral control for the infant stimulus.

Study 2: Spontaneous facial expressions

We examined whether women would frown less and/or smile more in reaction to an infant in a laboratory setting. As before, we primed participants with a romantic or a neutral scenario. We then asked them to watch a video of infants (or a neutral film) and videotaped their facial activity while they did so.

Materials and Methods

Participants

Eighty female psychology students took part in this experiment. Of these, 71 were retained for analysis (see below for exclusion criteria). The average age of the retained sample was 18.61 years ($SD = 0.89$); 96% identified themselves as British, and 4% as Other European. Forty-seven per cent reported being single; 31% were in casual or steady dating relationships, and 22% were in serious committed relationships. None of the participants was married or had any children.

Stimuli

Two films, each 1-minute long, were prepared in advance of the study. Film 1 (infants film) was an edited version of the Pampers *Peace on Earth* commercial (the Pampers logo was edited out); it depicts sleeping infants with *Silent Night* playing over it; this film served as the experimental stimulus. Film 2 (neutral film) served as the control stimulus. It depicted scenes of the Amazonian rainforest accompanied by peaceful classical music. The facial expressions were analyzed for the entire lengths of the films. We used the same scenarios as those used in Study 1 to evoke romantic and control mindsets.

Measures of spontaneous facial expressions

All spontaneous facial expressions were coded using FACS (Ekman et al., 2002). Three facial movements were coded. First, following Carton and Carton (1998), we scored Duchenne, or genuine, smiles (AU6+AU12: cheek raiser and lip corner puller) as an index of affection. Second, we scored slight smiles (AU12A/B) as another measure of affection. Note that we only scored AU12 when it occurred at low intensities. This measure should not be confused with a non-Duchenne (fake) smile; it is only when AU12 occurs at high intensities in the absence of AU6 that the expression looks fake. For analytic purposes, Duchenne and slight smiles were combined. Third, we scored frowning (AU4: brow lowerer) as an index of negative expressions.

Both coders were FACS-certified. The first coder was blind to the conditions of the experiment but not to the hypotheses of the investigation; she was also aware of the contents of the videos. The second coder coded 15% of the video data. He was blind both to the hypothesis and the conditions, and unaware of the contents of the videos seen by

participants. Inter-rater agreement was 76%, which showed that the codings were appropriately reliable. In view of the high degree of agreement between the two coders, only the first coder's codings were used for analysis.

Preliminary examination of the video data revealed that participants' facial behaviour in reaction to the films was characterized by frowns and smiles that lasted for relatively long stretches of time, varying slightly in intensity along the way. We therefore reasoned that the customary event-based and intensity-based coding systems – which are best used for facial activity of relatively short duration with well-defined on-sets, apexes and offsets – were unlikely to reflect the facial activity in our datasets accurately. In view of this, we opted for a method that combined measures of intensity and duration (described below) to produce a more accurate representation of the facial activity we observed.

In preparation for coding, each 1-minute section of video data was divided into 10-second segments. Within each segment an event was scored by its intensity and duration according to the following scheme: one event of up to 3 seconds – one count at a given intensity (e.g., A, C, E); 2 events or one event between 3.1 and 6 seconds – 2 counts at a given intensity (e.g., 2A, 2C, 2E); and finally 3 events or one event between 6.1 and 10 seconds – 3 counts at a given intensity (e.g., 3A, 3C, 3E). We then translated these codings into numerical values, using the following scoring method: $A/B = 1$, $C = 3$, $D/E = 9$.

There are two features in this method that need explaining. First is the choice of numerical values. In our coding system, we used multiples of intensity scores to represent duration. We therefore needed to devise a system where the relationship between the three intensity levels would be preserved when the three duration levels were added to the equation. In other words, we wanted to make sure that the A-to-C relationship stayed the same as the C-to-E relationship, and in the system we chose, this is the case: $3A = C$, while $3C = E$. This was *not* the case for other scoring methods we considered ($A/B = 1$, $C = 2$, $D/E = 3$ and $A/B = 1$, $C = 3$, $D/E = 5$).

The second feature of the translation method that needs explaining is the decrease in the number of intensity levels. We equated intensities A and B (trace and slight), and D and E (severe, extreme and maximum) to produce a 3-level system: trace/slight – marked/pronounced – severe/extreme/maximum. This was necessary in order to enable us to include three levels of duration to our coding method without giving events of high intensities (D and E) too much weight in our dataset (in the three-level system, $E = 9A$, while in the 5-level system $E = 81A$). It is important to note that the 'resolution' of our coding has been enhanced rather than diminished as a result: where the 5-intensities system differentiates between five events, the 3-intensities-and-3-durations system differentiates between 9.

Procedure

After providing informed consent, participants read a story that primed either a romantic or a control mindset. Participants next watched both stimulus films (order was counterbalanced) while their facial behavior was videotaped. Participants were aware that they were being videotaped, but funnel debriefing at the end of experimental sessions suggested that no participant correctly guessed the purpose of the investigation. After each film, participants indicated how much affection, amusement, sadness and surprise they had felt while watching the films (0 – not even the slightest bit of the emotion, 8 – the most I have ever felt in reaction to a movie); they also reported the general valence of the affect

they felt during the two movies (0 – *unpleasant*, 4 – *neutral*, 8 – *pleasant*). Finally, participants were thanked and debriefed.

The design was a 2 (Mindset: romantic vs. control) x 2 (Film: infants vs. neutral) mixed factorial design. Mindset was a between-subjects factor; film type was a within-subjects factor.

Results

Exclusion criteria

Of the 80 participants who took part in this study, nine were excluded for the following reasons: (i) reporting being homosexual, or failing to indicate sexual orientation (2); (ii) poor video quality (4); (iii) experiencing intense anger during the neutral movie (as revealed by funneled debriefing – the participants were reminded of deforestation and other environmental issues while watching the film: 2); and (iv) not being affected by the romantic scenario (as revealed by the manipulation checks: 1).

Manipulation check

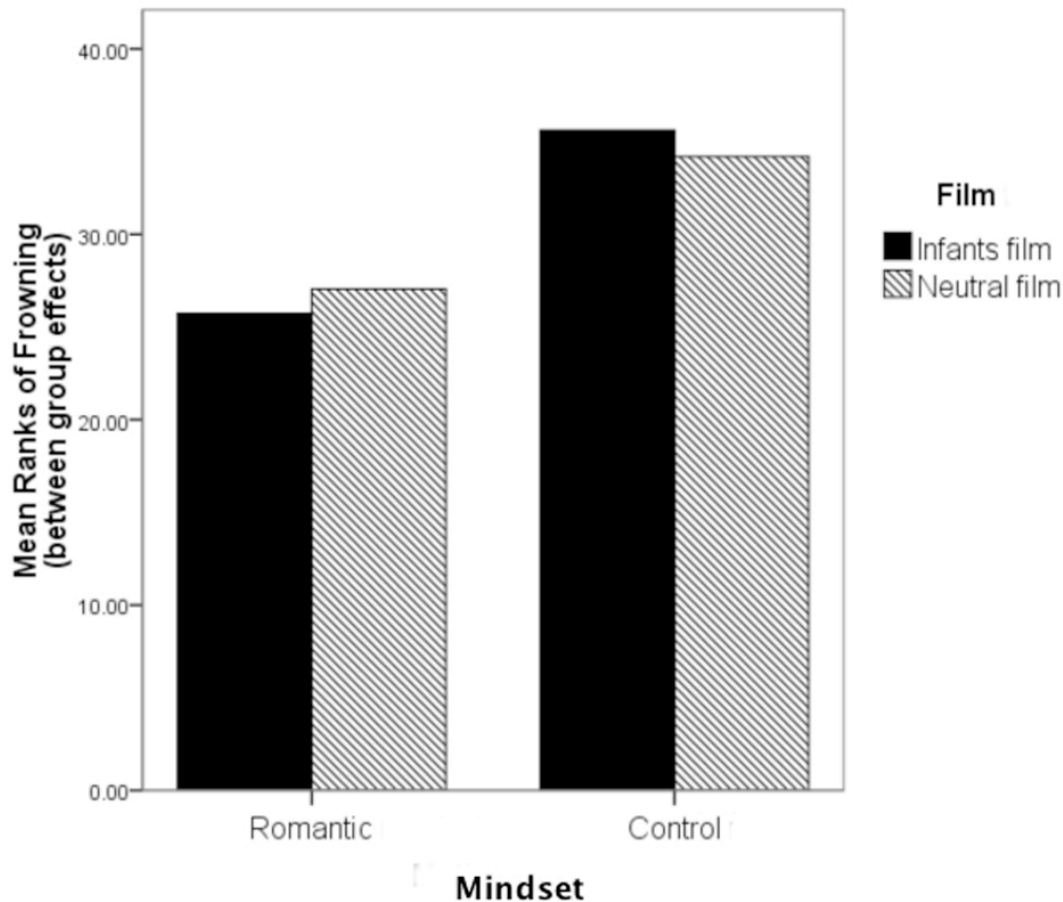
There was a significant effect of mindset on romantic arousal, $t(62.44) = 14.75$, $p < 0.0001$, $d = 3.73$, happiness, $t(42.78) = 3.70$, $p = .001$, $d = 1.13$, and excitement, $t(47.19) = 3.37$, $p = .002$, $d = 0.98$, reported after reading the priming scenarios. Although happiness and excitement, as well as romantic arousal, were affected by the mindset manipulation, we considered the manipulation to be successful because the main findings cannot be easily explained in terms of happiness or excitement (see General Discussion).

Spontaneous facial expressions

For all measured AUs, the standardized skew and kurtosis was greater than the recommended 1.95 value (Field, 2005) and the Shapiro-Wilk tests of the normality of distribution were significant (smallest $p = .026$). All nonverbal data were therefore analyzed using non-parametric tests and the two hypotheses were tested separately.

A Mann-Whitney U test revealed that there was no significant effect of mindset on smiling during either the infants film, $z = 0.83$, *ns*, or the neutral film, $z = 1.20$, *ns*. There was, however, a significant effect of mindset on the amount of frowning while watching the infants film, $z = -2.20$, $p = .028$, $r = .26$, such that participants in the romantic mindset condition (Mean Rank = 25.73) frowned less than participants in the control condition did (Mean Rank = 35.60). The equivalent effect was not significant for the neutral film, $z = -1.57$, *ns* (see Figure 2).

Figure 2. The effects of mindset and film on amount of frowning



Reported emotions

2 (Mindset) * 2 (Film) mixed ANOVAs on reported emotions (affection, amusement, sadness and surprise) and valence did not reveal any significant main effects of mindset or interactions between mindset and film (all $ps > .23$). For sadness and surprise, there were also no significant main effects of film (all $ps > .49$). For the rest of the items there were consistent significant main effects of film: First, participants experienced more affection, $F(1, 69) = 133.23, p < .0001, \eta^2 = .66$, during the infants film ($M = 6.38; SD = 1.80$) than during the neutral film ($M = 3.39; SD = 2.02$). Second, they experienced more amusement, $F(1, 69) = 9.58, p = .003, \eta^2 = .12$, during the infants film ($M = 3.32; SD = 1.90$) than during the neutral film ($M = 2.55; SD = 1.61$). Finally, the valence of the affect participants experienced, $F(1, 59) = 18.2, p < .0001, \eta^2 = .24$, was more positive during the infants film ($M = 7.36; SD = 1.61$), than during the neutral film ($M = 6.34; SD = 1.82$).

Discussion

The mindset manipulation did not affect the amount of smiling, but it did affect the amount of frowning during the infants film, such that women primed with long-term romance frowned less than did women primed with a control mindset. We therefore

replicated the results of Study 1, this time using a measure of spontaneous rather than self-reported facial behavior. We also ruled out the alternative explanation that women have a generalized tendency to express less negative affect when in a romantic context: Women in the romantic mindset did not frown significantly less than women in the control mindset when they viewed a neutral film.

Caution must be exercised in interpreting these results, however. We did not test for an interaction between frowning and smiling in Study 2, so it would be erroneous to conclude that women frown less but do not smile more in response to infants when they are in the romantic mindset based on these data. What the findings allow us to conclude is that – in accord with the logic we spelt out in the introduction – in the romantic context women frown less; the findings do not allow us to conclude that women smile more in this context.

General Discussion

In two studies, using different paradigms, we investigated whether women varied their emotional reactions to infants when in a romantic mindset, and whether they did so by augmenting positive reactions (Hypothesis 1) or by attenuating negative reactions (Hypothesis 2). As expected, in both studies we found support for Hypothesis 2, but not Hypothesis 1: the data showed that women in the romantic mindset frowned less.

Interestingly, there were no effects on participants' reactions to infants other than facial behaviour. Participants in the romantic mindset did not rate the infant as more attractive (Study 1), and they did not feel more affection while watching the infants film or find the film any more pleasant than their counterparts in the control mindset (Study 2). It therefore seems that the observed difference in nonverbal behavior is strategic, in the sense that it did not reflect an underlying difference in affective or cognitive state. This also implies that the effects cannot be attributed to any generalized tendency to view infants in a more favorable light after thinking about romantic situations.

Alternative explanations

Manipulation checks in both studies showed that the scenarios used to prime romantic and neutral mindsets changed more than simply the romantic arousal experienced by participants. In Study 1, participants experienced more happiness after reading the romantic scenario; in Study 2, participants experienced more happiness and excitement after reading the romantic scenario. We were able to control for the unintended difference in happiness in Study 1 and found that the predicted interaction between mindset and frame on reported facial behavior was significant after controlling for the levels of happiness and for the interaction between happiness and frame type.

The need to use nonparametric statistics to analyze facial behavior in Study 2 made it impossible to control statistically for the unintended differences in happiness and excitement. However, there are reasons to believe that the difference in the facial behavior was not due to differences in how happy and/or excited the participants felt. First, the size of the effect of mindset on romantic arousal was substantially larger than the comparable effect sizes for happiness and excitement, which makes the interpretation of effects on facial behavior in terms of romantic arousal more plausible. Second, the results cannot be readily explained in terms of either happiness or excitement. The facial action most closely associated with happiness and excitement is smiling, rather than frowning, so if happiness

and excitement influenced facial behavior there should have been an effect of mindset on smiling, rather than frowning.

Third, explaining both the effect of mindset on facial behavior during the infants film and the absence of an effect of mindset on facial behavior during the neutral film in terms of happiness and excitement, rather than romantic arousal, seems implausible, especially given the fact that the film order was counterbalanced across participants.

Relationship status

An implicit assumption of the current research is that mindset would have an effect on participants' self-presentational behavior independently of participants' actual relationship status. Previous research (e.g., Griskevicius et al., 2007; Griskevicius et al., 2006) found an effect of the same priming materials on romantic self-presentation, without taking participants' relationship status into account. Our studies were therefore not designed to examine the way in which relationship status moderated the effect of mindset on self-presentational behavior. However, we did measure relationship status. In both studies participants had to select one of five options that best described their current relationship status: single; in a casual dating or sexual relationship; in a steady dating relationship; in a serious committed relationship; or married. Relationship status did not moderate the effect of mindset on facial behavior in either study, although the absence of such moderating effects needs to be interpreted cautiously in view of the low power the present studies had to detect such effects.

Theoretical implications

The results support the hypothesis that women's negative reactions to infants decrease in a romantic context. This hypothesis was based on the premise that it would be adaptive for men not to form relationships with women who show lack of affection towards infants. It is important to note that we are not making an argument about whether female self-presentation in this case would be directed at men pursuing long-term or short-term sexual strategies. This is because even though it would be costly for men pursuing long-term sexual strategies to become committed to a woman who turns out to be a poor mother, these men could potentially compensate for the parental inadequacies of their partners by providing more paternal care. This is not an option for men pursuing short-term sexual strategies, so it could be argued that these men should also be concerned about the mothering qualities of their potential sexual partners.

We have assumed that it would be women pursuing long-term sexual strategies who would be motivated to self-present in such a way. This was reflected in the fact that the scenario we used to induce the romantic mindset in women depicted the beginning of a long-term committed relationship. From a theoretical perspective, the assumption is based on the notion that women pursuing short-term sexual strategies do not need to engage in elaborate self-presentation to available men, because it is the female decision to engage in a sexual relation that constitutes a limiting factor in the realm of short-term romance. In other words, and to put it simplistically, when expected paternal investment is low, men self-present, while women choose. In line with this logic, Griskevicius, Cialdini and Kenrick (2006) found that unlike men, women do not respond to a manipulation inducing a short-term romantic mindset by exhibiting more self-presentational behaviors.

Limitations and further research

One limitation of the current research is that it did not include a male sample. We have previously shown that males also change their facial emotional reactions to infants in the context of romance (Dosmukhambetova and Manstead, 2012). In that study we used stimuli identical to the ones in Study 2 of the present paper, but we manipulated romantic mindset using a different method. More specifically, we led participants to believe that an attractive (vs. unattractive) research assistant was observing them through a video camera during the experiment. We found that, unlike females in this study, males augmented positive expressions but did not attenuate negative expressions in response to the film depicting infants. Further research should examine the reliability of this apparent three-way interaction between gender, mindset and film.

Another limitation of the current research is that we used priming materials rather than a real audience to manipulate romantic motivation. As explained in the introduction, the reason was that women do not seem to respond to the presence of an attractive man in the same way that men do to the presence of an attractive woman. The fact remains, however, that research into female romantic self-presentation would benefit from the development of an audience manipulation that effects predicted changes in female behaviour. For a rare successful example, see Zanna and Pack (1975).

Conclusion

Two studies were conducted to examine whether women in a romantic context modify their facial behavior and other reactions towards infants, presumably in order to appear more desirable. Two alternative hypotheses were considered. Hypothesis 1 was that women would augment positive reactions towards infants in a romantic (vs. control) context. Hypothesis 2 was that women would attenuate negative reactions towards infants in this situation. The results of both studies were consistent with Hypothesis 2, but not Hypothesis 1: participants in a romantic mindset frowned less in reaction to infants. The present research adds to the existing literature by showing how people use emotional displays to achieve social goals.

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