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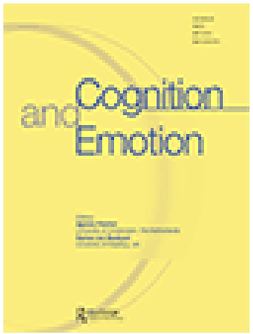

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"Tears of joy" & "smiles of joy" prompt distinct patterns of interpersonal emotion regulation

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ABSTRACT

Close relationship partners often respond to happiness expressed through smiles with capitalization, i.e. they join in attempting to up-regulate and prolong the individual's positive emotion, and they often respond to crying with interpersonal down-regulation of negative emotions, attempting to dampen the negative emotions. We investigated how people responded when happiness was expressed through tears, an expression termed dimorphous. We hypothesised that the physical expression of crying would prompt interpersonal down-regulation of emotion when the onlooker perceived that the expresser was experiencing negative *or* positive emotions. When participants were asked how they would behave when faced with smiles of joy, we expected capitalization responses, and when faced with tears of joy, we expected down-regulation responses. In six experimental studies using video and photographic stimuli, we found support for our hypotheses. Throughout our investigations we test and discuss boundaries of and possible mechanisms for such responsiveness.

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People are social creatures (Beckes & Coan, 2011) who form communal bonds with others, and are motivated to be responsive to relationship partners (Clark & Aragón, 2013). Since expressions of emotion signal much about partners' welfare, responsiveness to partners' emotional expressions serves as a basis for people to provide understanding, validation and care (Clark, Fitness, & Brissette, 2001). Indeed, normatively, when perceivers do care about their partners they react to partners' expressed emotions with enhanced support (Clark, Boothby, Clark-Polner, & Reis, 2015; Clark, Ouellette, Powell, & Milberg, 1987; Graham, Huang, Clark, & Helgeson, 2008).

When something good happens, for example when an individual wins a prize or is victorious in sport, he or she is likely to display a smile, i.e. an emotional expression traditionally considered congruent within those positive contexts. Onlookers' interpretations of genuine smiles within positive contexts are typically congruent too, meaning that genuine smiles are typically taken to represent positive emotions (Frank, Ekman, & Friesen, 1993). Relationship partners detect and respond to one anothers' expressions of positive emotions, as opportunities to promote affiliation and bonding (Becker, Anderson, Mortensen, Neufeld, & Neel, 2011). Particularly pertinent to the present work is the now well-documented phenomenon known as capitalization, whereby when individuals express good news, generally accompanied by positive emotions, close others often join in up-regulating and prolonging those positive feelings (Gable, Gonzaga, & Strachman, 2006; Gable & Reis, 2010; Gable, Reis, Impett, & Asher, 2004; Reis et al., 2010).

Of course, close relationship partners not only respond to one anothers' expressions of positive emotions with support, they also respond to expressions of negative emotions with support (Graham et al., 2008). When close others cry within negative contexts relationship partners infer that their partners are experiencing distress, and strive to

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down-regulate that emotion by providing comfort and emotional support (Hendriks, Croon, & Vingerhoets, 2008). Crying promotes social bonding, beginning with early-life responsiveness in the form of comfort, soothing, and close physical proximity between an infant and caregiver (Bowlby, 1958). Such patterns of responsiveness to observed crying endure into adulthood (Nelson, 2005). When people see close relationship partners crying, the physical displays prompt intentions to soothe (Hendriks et al., 2008; Hendriks & Vingerhoets, 2006), empathic understanding of the crier's distress (Hendriks et al., 2008; Hendriks & Vingerhoets, 2006), and physiological changes indicative of personal distress within the observer (Ioannou et al., 2016). Crying is thought to be an evolved signal that elicits responsiveness despite the costs of the crier signaling that he or she is vulnerable (especially in the case when tears blur one's vision) or showing weakness (Hasson, 2009).

The question might be posed then, what type of interpersonal response occurs when partners cry in positive contexts? For more than a century psychological research has documented that crying responses do occur within positive contexts (Aragón & Bargh, 2017; Aviezer, Trope, & Todorov, 2012; Borgquist, 1906; Fernández-Dols & Ruiz-Belda, 1995; Vingerhoets, van Geleuken, Van Tilburg, & Van Heck, 1997; Wenzler, Levine, van Dick, Oertel-Knochel, & Aviezer, 2016). Moreover this type of expression, at times, is deemed highly appropriate by onlookers (Wong, Steinfeldt, LaFollette, & Tsao, 2011), and, at times, is judged as *the* expression most indicative of great happiness (Aragón & Bargh, 2017; Fernández-Dols & Ruiz-Belda, 1995), even over the traditional representations of happiness, i.e. smiling (Aragón & Bargh, 2017; Fernández-Dols & Ruiz-Belda, 1995; Fiske, in press). Recent emotion theory refers to such emotional expressions as dimorphous expressions of emotion (Aragón, 2017; Aragón & Bargh, 2017; Aragón & Clark, 2017; Aragón, Clark, Dyer, & Bargh, 2015) meaning that although one may produce a genuine smile when feeling positive emotions (Frank et al., 1993), in addition to displaying smiles that are congruent with one's positive state, a person also may display expressions traditionally (Ekman & Friesen, 1971) not considered congruent with positive states—expressions such as frowns or tears.

The word congruent in reference to dimorphous expressions has a specific meaning. When an expression communicates the same valence of emotion as what is experienced, with and without the observer having access to its original context, it is congruent (e.g. smiles upon winning a contest are seen as positive in nature, and when no context is provided smiles are still seen as positive in nature). In contrast, when an expression communicates one valence of emotion within its original context, and the opposite valence of emotion when removed from context, it is not congruent, because it relies upon the context in which it was expressed to communicate the general valence of emotion that it represents (e.g. crying upon winning a contest is seen as positive in nature within that context, but the crying expression is judged to be negative in nature when no context is provided, see for example Aragón & Bargh, 2017). Past work has defined dimorphous expressions of emotion as arising from an appraisal of a single valence, and a single corresponding emotional experience, with an outward display of emotion that contains two distinct expressions, one normatively congruent, and one normatively incongruent with the experienced emotion (Aragón, 2016, 2017; Aragón & Bargh, 2017; Aragón & Clark, 2017; Aragón et al., 2015). These two expressions alternate or might scramble in their display, yet they are recognisable within one's self and by others as two distinct displays that occur close in time to the onset of the emotional experience (e.g. I smiled and I cried).

Various examples of such expressions are noted in psychological literature: some people smile when experiencing sadness (Fredrickson & Levenson, 1998), smile when experiencing disgust (Ansfield, 2007), smile when embarrassed (Ambadar, Cohn, & Reed, 2009), laugh when they are angry (Bonanno & Keltner, 1997), display aggressive-types of expressions when they are feeling tender care (Aragón et al., 2015), cry when overwhelmed with happiness (Fernández-Dols & Ruiz-Belda, 1995), cry when experiencing the emotion "elevation" when witnessing the good deeds of others (Aragón, 2017), and cry when overcome with the sudden sense of becoming communally close with another person (Fiske, in press). Such expressions have been defined as a class of expressions unto themselves (Aragón & Clark, 2017; Aragón et al., 2015) that appear to arise when emotions are intense (Aragón & Bargh, 2017; Aragón et al., 2015). In a recent theoretical paper, we further suggested that dimorphous expressions of emotion might be adaptive in that they might signal that help is needed to down-regulate an intense emotion (Aragón & Clark, 2017). Here we investigate this idea in the context of expressions of positive emotions.

The framework of dimorphous theory provides a unique perspective from which to investigate capitalization and down-regulation responses that are triggered by the combination of social context and facial displays of emotion. For instance, if a close-relationship partner smiles while winning a prize, an onlooking friend most likely will perceive the expresser is feeling positive emotions. However, because of the congruency between the positive context, and the normatively positive emotional expression, congruent scenarios do not provide dissociable information about the unique contributions of context and expression on interpersonal responsiveness.

If, however, a close-relationship partner cries upon winning a prize, and the partner still perceives that the expresser is feeling positive emotions, then different predictions can be made about interpersonal responses dependent upon the influence of context and expression. If context were the sole influence on interpersonal responsiveness, then one would expect in positive contexts to see a response of capitalization. If the expression of crying is the sole influence on interpersonal responsiveness, then one might expect to see a response of down-regulation, even when the emotion is considered positive in nature. If both context and expression influence interpersonal responsiveness, one would expect to see a blended response—with a desire to attend to the welfare of one's happy friend, but also a desire to down-regulate his or her positive emotions in the moment.

In this paper we report six experiments, designed to test these ideas. This series of studies had a very specific aim, which was to understand the contributions of context and expression on interpersonal responsiveness, and dimorphous theory provides a way to do so. Our central hypotheses were the same for all studies. We expected that both the context and the expression would have an influence on interpersonal responsiveness.

H_1: In the monomorphous positive conditions in which an imagined friend smiled upon winning, participants were faced with both a positive context, and a positive expression (Studies 1 through 6): We predicted participants would perceive predominantly positive emotional experiences in that person and would report responding in ways as to up-regulate those emotions, i.e. capitalization.

H_2: In the dimorphous conditions in which an imagined friend cried upon winning, participants were faced with a positive context, and a, normatively, incongruent expression (Studies 1 through 6): We predicted participants would perceive predominantly positive emotional experiences in these instances. We further expected that seeing the physical expression of crying would prompt greater reports of down-regulation responses, and reduced reports of capitalization responses relative to those participants in the monomorphous conditions. This finding would support the idea of individual contributions of context and physical expression in interpreting the situation and on interpersonal responsiveness.

H_3: In the monomorphous conditions wherein an imagined friend cried upon losing, participants were faced with both a negative context, and a negative expression (Studies 3 through 6): We expected participants to perceive predominantly negative emotional experiences, and to report wanting to down-regulate those emotions, i.e. to provide soothing social support.

We present six experimental studies that incrementally tested our hypotheses. The series taken as a whole replicated, broadened the scope, and identified boundary conditions for the hypothesised effects. In Study 1 and Study 2 we manipulated expression within positive contexts using video stimuli (actors smiled, or they both smiled and cried). In Studies 3 and 4 we added additional contrasts by manipulating both expression and context to be positive or negative (winning or losing contexts). We also broadened our findings by using photographic stimuli, including both photographs validated as representing happy and sad expressions, and naturalistic photographs taken from intensely emotional situations. In Study 5, we tested a boundary of our predicted effects. We asked if people must see the actual expression to obtain the effect, or if simply learning that a friend is crying in a positive situation through a narrative is sufficient for interpersonal down-regulation responses. In Study 6 we replicated Study 4, and attempted to understand the motivations behind the interpersonal regulation responses within our participants. We measured participants' personal discomfort with their friends' expressions, their perceptions of their friends' discomfort during their expression, their perceptions that their friends had lost control over their emotions, and their desire to demonstrate care for their friends.

Study 1

Study 1 tested the central hypothesis that distinct combinations of context and expression of emotion would elicit distinct patterns of interpersonal responsiveness. Participants were assigned randomly to view one of two videos of a person with whom they

were asked to imagine being close friend. To provide context, the person in the video always verbally expressed happiness (i.e. "I'm so happy!"). In one version this person physically displayed smiles (the monomorphous expression of happiness condition); in the other, the person displayed both smiles and crying (the dimorphous expression of happiness condition). Participants then reported the extent to which they would capitalize and the extent to which they would attempt to down-regulate thier friend's emotions.

We expected that participants assigned to view dimorphous expressions of explicitly stated positive emotions would report higher efforts to down-regulate the expresser's state, and lower capitalization attempts than would participants assigned to view monomorphous expressions of explicitly stated positive emotions. We also questioned if dimorphous expressions inherently are perceived as more intense. If so, then perceptions of the intensity of emotion might drive any differences that we would find between conditions. Therefore, we included a measure of perceived emotional intensity to address this potential mechanism.

Method study 1

Participants

Participants ($N = 149$; 63% male; mean age = 34.28 years, SD = 11.61, range = 18–72; self-reported as 79% White, 11% Asian, 7% Black, 3% Hispanic/Latino, and <1% other) were recruited online through Amazon's Mechanical Turk and compensated .25 for the approximately 3-min survey advertised as "*Answer 2–4 min survey. View photograph, short video, answer questions*." Of the 154 participants who logged in to the survey, 1 logged in multiple times, and 4 did not answer more than one of the dependent variable items (total attrition: $N = 5$, 3%, attrition did not differ by condition, $p = .84$). The data from participants who logged in multiple times were removed because the participants had disregarded our requests to log in only once for the study. All studies conducted for this manuscript, including pilot studies, were run in accordance with protocols approved by a university review board.

Determination of sample size was made through power analysis for repeated measures, within-between interaction (G*Power software, alpha error probability = .05, correlation among repeated measures = .376, with an effect size of partial eta squared of.164 determined by a pilot study). The power analysis called for 75 participants per cell. For all studies reported in this manuscript, we calculated data collection stopping rules to meet this power threshold and all key findings report observed power. We report results for all data collected, all manipulations, and all measures used in each study.

Materials and procedure

After providing informed consent, participants were welcomed to the study:

> Welcome. Thank you for participating in our study! Instructions: You will view a photograph with a short description, then a very short video clip followed by a few questions. There are no right or wrong answers to these questions. We simply are curious about how people respond to these videos.

Similar welcome pages were presented in all studies reported in this manuscript. On the next page of the survey, participants read a short introduction about their imagined "friend" and about the context of the relationship. In all of the experiments reported, the relationship context was described as being one of close relationship partners, because past research suggests interpersonal responsiveness differs when considering someone with whom we do or do not have a such relationship (Clark et al., 1987; Vingerhoets, 2013).

> For the purpose of this exercise please suppose that this person is a good friend of yours. You are comfortable with this person and the two of you have a good relationship. Something extremely good has just happened to your friend and he is overwhelmed with emotion.

Below this statement was a photograph of the face of the person who would be featured in the video (Please see Supplemental Materials.). Participants were next asked to orient their attention to their friend's reaction, "*On the next page is a video clip that shows your friend's reaction to the news.*" For Studies 1 and 2 this page had the additional statement,

> The video is very short. Please be sure to have your volume up on your computer before beginning. Please also note that the video is only about 7 seconds long, so paying attention to your computer screen while it is playing is essential for the follow up questions.

Participants viewed actors portraying either a monomorphous expression, meaning happiness expressed through smiles, or a dimorphous expression, meaning happiness expressed through smiles and crying. In all studies reported in this manuscript, the presentation of male and female models was

distributed evenly across conditions to generalise findings to expressions of emotion for both sexes. The gender of the actor was counterbalanced with either a male stimulus or a female stimulus randomly selected for presentation. All questions were tailored with gender appropriate pronouns and adjectives (i.e. he/she, him/her, his/her).

Movie stimuli: Four 7-sec clips (male model monomorphous, female model monomorphous, male model dimorphous, and female model dimorphous) featured actors who were in their early twenties. The models sat in front of a solid white backdrop, approximately 2 feet from the camera. The actors faced the camera, displayed mono or dimorphous expressions of emotion and explicitly said, during their emotional display, "I'm so happy. I'm so happy."

Intensity of emotions felt: After participants viewed the video stimulus we asked them how intense they perceived their friend's emotions to be with two items ($r = .64$, df = 148, $p < .05$): How intense are your friend's emotions? How overwhelmed is your friend with emotion? Response options were: 1 = *not at all intense,* 2 = *mildly intense*, 3 = *moderately intense*, 4 = *strongly intense*, and 5 = *overwhelmingly intense*.

Participants' interpersonal response: Participants read, "*In one or two sentences, please describe how you would act in this moment with your friend*." Participants were provided with an open text box for their responses. This prompt was provided to ensure that participants considered the situation in depth and what they themselves would do. This prompt also served as a check of attention. Participants who did not respond, or who wrote in responses that indicated they had not paid attention to the video were labelled as incomplete responses, as it was unclear when they stopped attending to the stimuli. Data from these participants were removed from the analyses, and these removals were noted in the section on participants for each study.

Only after participants formulated their free responses-- independent of our suggestions, did we then ask them, "To what extent do you agree you would respond to him in the following ways?" (1 = *disagree completely*, 2 = *disagree*, 3 = *disagree slightly*, 4 = *agree slightly*, 5 = *agree*, 6 = *agree completely*). Five items ($\alpha = .86$) captured responsiveness to capitalize the friend's emotions: "I'd try to amp him up." "I'd encourage him to feel more of what he was feeling." "I'd try to energise his feelings even more." "I would react in a way as to help him intensify what he was feeling." and "I would do things to prolong his feelings." Five items ($\alpha = .86$) captured responsiveness to down-regulate the friend's emotions: "I'd try to calm him down." "I'd tell him to take a deep breath." "I'd place my hand on his back or shoulder to calm him down." "I help him by giving him space to cope with the feeling himself." and "I would likely try to help him gain control of his feelings."

At the conclusion of the study, participants were asked their age, sex and ethnicity, and were provided an open text box for any questions comments or concerns they might have had. Participants then were thanked for their time, and were provided with a written debriefing. This conclusion was the same for all studies reported in this manuscript.

Results[1]

Perceptions of emotional intensity

Participants perceived the emotions displayed to be highly intense in both the monomorphous ($M = 4.43$, SD = .69) and the dimorphous ($M = 4.58$, SD = .63) conditions, $p = .176$. In all studies reported in this manuscript participants perceived strong to overwhelming emotions across all conditions. Means in the dimorphous conditions were consistently larger than means in monomorphous conditions, however not consistently significantly higher. Thus intensity of emotion did not provide a mechanism, or an alternative explanation for our findings. We report the results from the analyses of the intensity variables from this point forward just in the tables.

Interpersonal regulation

Participants' reported interpersonal regulation strategies (capitalization, down-regulation) were analyzed in a repeated-measures general linear model, with condition (monomorphous, dimorphous) entered as a fixed factor. As hypothesised, there was a significant interaction between condition and interpersonal regulation strategy, $F(1, 147) = 24.97$, $p < .001$, partial eta^2 = .145, observed power = .999. Participants assigned randomly to view happiness expressed through smiles (monomorphous, $M = 4.04$, SE = .12) imagined that they would make efforts to capitalize on their friend's feelings more than did participants assigned randomly to view happiness expressed through smiling and crying (dimorphous, $M = 3.44$, SE = .12). This pattern was reversed when considering interpersonal down-regulation of emotion. Participants assigned randomly to view happiness expressed through smiling and crying (dimorphous, $M = 3.54$,

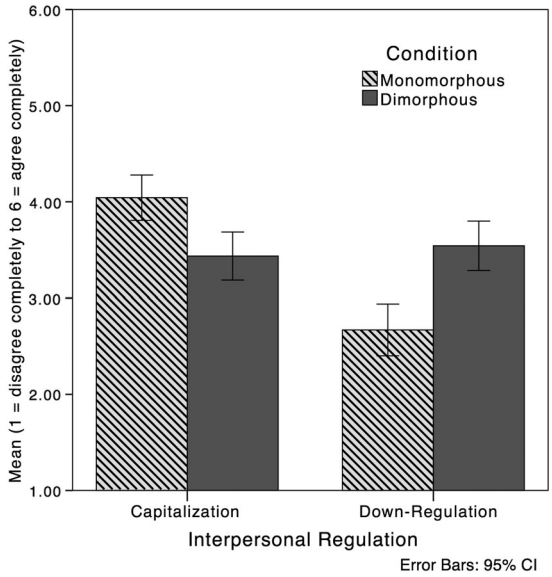

Figure 1. In Study 1, in which participants viewed video taped actors, participants in the monomorphous condition reported higher capitalization than those in the dimorphous condition. Participants in the dimorphous condition reported higher down-regulation than those in the monomorphous condition.

SE = .13) imagined that they would make greater efforts to down-regulate their friend's feelings than did participants assigned randomly to view happiness expressed through smiles (monomorphous, $M = 2.67$, SE = .13). See Figure 1.

Study 1 discussion

As hypothesised, within this minimal context, participants perceived their friend was experiencing extreme emotions. In the condition in which the context and the expression were congruent (monomorphous), our research was consistent with past research (Gable & Reis, 2010; Gable et al., 2004; Reis et al., 2010) showing capitalization responses from our participants. In contrast when a positive context was presented with an incongruent expression of crying, participants responded with higher down-regulation and lower capitalization than in the monomorphous condition.

We originally speculated that a straightforward explanation for the observed interpersonal responses would be that in the dimorphous condition participants simply considered their imagined friends to be experiencing more intense emotions- possibly, so intense that they needed help in regulating them. However, participants in this study inferred that their imagined friend was experiencing equally intense emotions in both the monomorphous and dimorphous conditions, as intensity ratings were in the "strong" to "overwhelming" range in both conditions. Therefore, the straightforward explanation of considering one's friend as overwhelmed when tears accompanied positive emotions did not explain the differences observed between conditions. It is possible that this particular measure is bounded at the high range of response options, and this may have been a result of our statement that their friend was "overwhelmed" with emotion. It may also be possible that even when perceptions of intensity were equivalent between our two conditions, that what differed was the perception of the friend's ability to cope with the intense emotions. We examine this possibility in Study 6.

Although, past research has shown that crying within a positive context can be experienced and perceived as a predominantly positive experience, and not a negative experience (Aragón, 2016, 2017; Aragón & Bargh, 2017), a reasonable alternative explanation for the pattern of findings observed in Study 1 is that in the dimorphous condition, with these particular stimuli, that participants might have perceived that the actors actually were experiencing negative emotion (in combination with positive emotion or not), and in the monomorphous condition participants perceived that the actors were experiencing purely positive emotions. Additionally, Study 1 provided participants with minimal information regarding the context (only the actors expressing "I'm so happy."), which could have led to different interpretations about the reasons for such happiness between the two conditions. In Study 2, we sought to replicate our effects, to understand what emotions our participants inferred, and to broaden the findings to responses provided within a richer and more specified context.

Study 2

In Study 2 we explicitly asked participants about the emotions they perceived their "friend" was feeling, and we provided additional contextual information that was identical in both the monomorphous and dimorphous display conditions. We hypothesised the same interactive effects of monomorphous and dimorphous conditions on reported interpersonal regulation responses as were observed in Study

1. We further predicted that both types of emotional displays would be interpreted as intense positive—but not negative emotions.

Study 2 method

Participants

Participants were recruited and compensated as described in Study 1 (MTurk, $N = 150$; 57% male; mean age = 32.55 years, range = 19–59, SD = 10.20; self-reported as 80% White, 9% Asian, 6% Black, 4% Hispanic/Latino, and %1 other). Of the 164 participants who logged into the survey we excluded data for 9 who did not complete the survey, and 5 who logged in multiple times (total attrition: $N = 14$, 8%). Attrition did not differ by condition, $p = .79$.

Materials and procedure

Materials were identical to Study 1 with the exceptions that: (1) participants were provided with more information about the context of the situation, and (2) we measured participants' inferences about the actors' emotions.

After the welcome page, the relationship context statement, and the introduction photograph, participants read,

> Your friend has just won a free 2-week rock climbing adventure. Rock climbing is not something that you are interested in, but it is something your friend always dreamed of doing since he was a little boy!

Past research has indicated that a partner's interpersonal response of capitalization might diminish when a close other has a positive event in a domain that is shared by both partners (Gable & Reis, 2010). Rock climbing was chosen for our scenario because it is a sport in which only 1.6% of the American population participates (The Outdoor Foundation, 2013). Additionally, we explicitly suggested to the participants that "rock climbing is not something that you are interested in." Furthermore, we described the friend as having won a rock-climbing trip, rather than as having succeeded in performance of rock climbing to reduce any possible imagined competitiveness between the participant and the "friend," which might also interact with interpersonal responsiveness (Gable & Reis, 2010). Following this contextual statement participants were told that their friend's response to the news would appear on the next page.

Emotions perceived: Positive and negative emotion variables were collected independently, because mixed emotion theory (Larsen & McGraw, 2014) raised the possibility that both positively and negatively valenced emotions can be evoked by one stimulus event and we wanted our measurement to be sensitive to this possibility. Likewise, we asked about specific emotions (happiness and sadness), but we also asked more generally about positive and negative emotions. This was done intentionally, to be able to say that participants interpreted the expressions as positive or negative in nature. Had participants interpreted the expressions as joy or relief, then the measurement of happiness alone might not capture those other positive emotions. The same is true for possible interpretations of negative emotions. Possibly, participants would not interpret the expressions to indicate "sadness" per se, but possibly some other flavor of negative emotion, e.g. regret, frustration, or deprivation. Therefore, we collected negative emotions with more global assessments as well.

Participants were asked, "To what extent do you feel he is _____." A positive emotion measure was created with averaged responses to the three questions: feeling happy, feeling positive and feeling up ($\alpha = .89$), and a negative emotion measure was created with averaged responses to the three questions: feeling sad, feeling negative, and feeling down, ($\alpha = .85$). Response options were: 1 = *feeling not at all*, 2 = *feeling mildly*, 3 = *feeling moderately*, 4 = *feeling strongly*, and 5 = *feeling overwhelmingly*. We counterbalanced the presentation order of the emotion variables, and the interpersonal responsiveness variables. We did this because considering emotions first might affect later reporting of responsiveness and considering types of responsiveness first might affect latter inferences of emotion.

The same measures of emotion intensity (2 items, $r = .77$, df = 149), capitalization (5 items, $\alpha = .92$), down-regulation (5 items, $\alpha = .82$), demographic variables, and the same debriefing were presented as described in Study 1.

Results

Interpersonal regulation

Using the same analytical strategy as reported in Study 1, we again found a significant interaction between condition and interpersonal regulation strategy, $F(1, 148) = 21.42$, $p < .001$, partial eta$^2 = .126$, observed power = .996. Participants in the monomorphous condition ($M = 4.12$, SE = .14) imagined that they would make efforts to capitalize on their friend's feelings

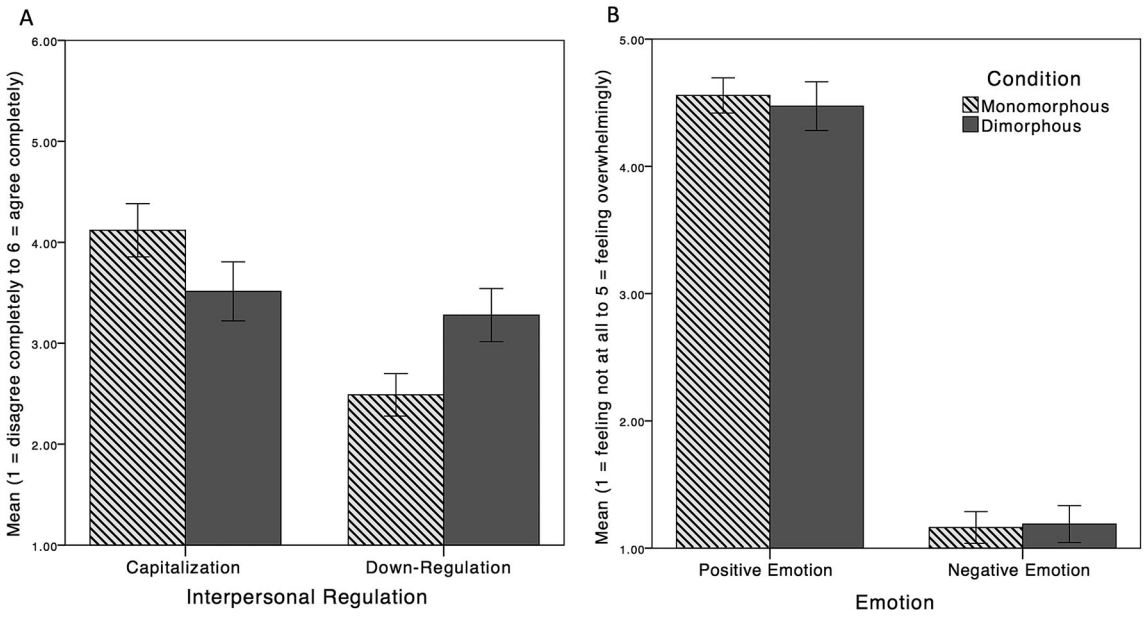

Figure 2. In Study 2 participants viewed video taped actors. Panel A illustrates that participants in the monomorphous condition reported higher capitalization than those in the dimorphous condition. Participants in the dimorphous condition reported higher down-regulation than those in the monomorphous condition. Panel B illustrates that Study 2 participants inferred predominantly positive emotions-- not negative emotions in both the monomorphous and dimorphous conditions. Error bars represent 95% confidence intervals.

more than did participants in the dimorphous condition ($M = 3.51$, SE = .14). This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the dimorphous condition ($M = 3.28$, SE = .12) imagined that they would make efforts to down-regulate their friend's feelings more than did participants in the monomorphous condition ($M = 2.49$, SE = .12). See Figure 2.

Emotions perceived

Positive emotions were perceived to be equally high in the monomorphous ($M = 4.56$, SE = .07) and dimorphous ($M = 4.47$, SE = .10) conditions ($p = .477$), and participants perceived negative emotions to be equally low in monomorphous ($M = 1.16$, SE = .06) and dimorphous ($M = 1.19$, SE = .07) conditions ($p = .779$).

Study 2 discussion

The results of Study 2 replicated those of Study 1, broadened the available evidence for these effects to apply to richer contexts, and tested the possible mechanism behind down-regulation observed in the dimorphous condition as related to the perception of negative emotions. In this experiment in which information was provided about a friend's life long dream, and winning of a contest, participants in the monomorphous expression condition again reported that they would respond with greater capitalization than participants in the dimorphous expression conditions. In contrast, participants in the dimorphous expression condition again reported that they would respond with greater down-regulation than did participants in the monomorphous expression condition. In the dimorphous condition, participants perceived the two types of expressions to convey the same high levels of positive emotion and the same low levels of negative emotion as those in the monomorphous condition. Thus, the patterns of reported interpersonal responses could not be explained by the interpretation that dimorphous expressions were actually expressions of negative, or even mixed emotions. This is consistent with research showing that dimorphous expressions are experienced as a singular valence of emotions-- not mixed emotions (Aragón, 2017). Considering the results from Study 1 and 2 together, it seems that neither the intensity of emotion perceived, nor the perception of negative emotions could explain the differences observed between the dimorphous and monomorphous conditions.

Our hypothesis that interpersonal responsiveness could be affected by both context and expression was supported. It is worth noting that in the dimorphous condition, capitalization responses were not entirely absent. However, they were attenuated to the point where they were significantly lower than capitalization responses in the monomorphous condition. Likewise, participants in both conditions rated their friend's positive emotion to be in the strong to overwhelming range, and down-regulation responses were not completely absent in the monomorphous condition. Rather, they were attenuated relative to those in the dimorphous condition.

Study 3

We designed study 3 in an effort to replicate the effects observed in the first two studies using photographic stimuli previously validated to represent what traditionally would be considered expressions of happiness and sadness by basic emotion theorists (Ekman & Friesen, 1971). Many of the incongruent facial expressions that take place during dimorphous expressions have been found to be indiscernible from their congruent counterparts, e.g. crying from happiness can be indiscernible from crying from sadness when removed from its original context (Aragón & Bargh, 2017; Wenzler et al., 2016). However, it is possible that there are unique characteristics about sad expressions that arise in positive situations that have yet to be identified. We tested if expressions of sadness, that came about when the expressers were asked to create a display of sadness are still interpreted as being highly positive when placed within a positive situation, and if so, would they then also attenuate capitalization, and bring about greater responses of interpersonal down-regulation.

We also added another contrasting condition in Study 3, in which there were three conditions: a happy face with positive context information (the person had just won a vacation contest; won-happy condition), a sad face with positive context information (the person had just won a vacation contest; won-sad condition) or a sad face accompanied with negative context information (the person had just lost a vacation contest; lost-sad condition).[2] These three conditions allowed us to contrast the effects of expression on interpersonal responses when positive context was held constant (won-happy expression and won-sad expression), and also allowed us to contrast the effects of positive versus negative context on interpersonal responses when expression was held constant (won-sad expression and lost-sad expression).

We expected that participants would interpret their friend to be experiencing predominantly positive emotions in both won-sad expression and won-happy expression conditions, and negative emotions in the lost-sad expression condition. We further hypothesised that interpersonal responses would show main effects of higher capitalization in the won conditions and higher down-regulation in the lost condition. However, we expected these effects of context to be moderated by expression. In the won-happy condition we expected reports of capitalization to be higher than reports in the won-sad, or lost-sad conditions. In contrast, in the won-sad and the lost-sad conditions we expected reports of down-regulation to be higher than reports in the won-happy condition.

Method

Participants

Participants (MTurk, $N = 232$; 100 female, 132 male; mean age = 34.60 years, range = 18–69, SD = 11.43; self-reported as 81% White, 7% Asian, 7% Black, 4% Hispanic/Latino, and 1% other) were recruited and compensated as previously described. Of the 247 participants who logged in to the survey, the data from 10 who did not complete the survey, and 5 who logged in multiple times were excluded (total attrition: $N = 15$, 6%, attrition did not differ by condition, $p = .83$).

Materials and procedure

Materials were identical to Study 2 with two exceptions: (1) participants were provided contexts of losing as well as of winning, and (2) instead of viewing a short video, participants viewed photographs from the Karolinska Directed Emotional Faces stimuli set (Lundqvist, Flykt, & Ohman, 1998). Dimorphous theory suggests the presence of two expressions alternating or scrambled in their display that occur over the duration of an emotional event. Although we were able to demonstrate both smiles and crying with the video stimuli (Studies 1 & 2), the photographic stimuli captured a single moment in time. In the dimorphous conditions the negative expression in a positive context is used to differentiate dimorphous from monomorphous expressions, and the presence of smiles at some point within the course of the winning experience is implied.

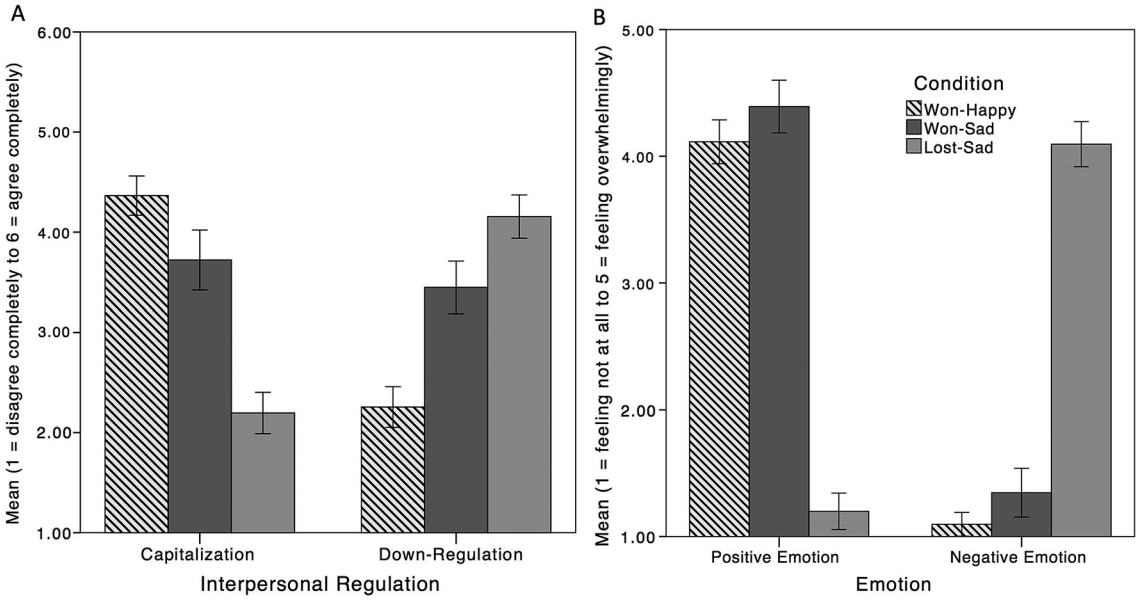

Figure 3. Study 3 presented participants with previously validated photographic stimuli in which models had been instructed to pose with happy and sad expressions. Panel A illustrates Study 3 capitalization and down-regulation responses as reported in the won-happy, won-sad, and lost-sad conditions. Panel B illustrates that in Study 3 "won" conditions were interpreted to bring about positive--not negative emotions, and the "lost" condition was interpreted to bring about negative—not positive emotions. Error bars represent 95% confidence intervals.

Context

In the "won" conditions participants read "Your friend has just won a free 2-week rock climbing adventure." In the lost-sad expression condition the word "won" was replaced with "lost his chance for."

Stimuli

Photographs were validated representations of happy and sad emotional expressions from the Karolinska Directed Emotional Faces stimuli set (Lundqvist et al., 1998). One female model (AF29HAS happy pose full face, AF29HAR happy pose ¾ view facing right, AF29SAHR sad pose ¾ view facing right) and one male model (AM34HAS happy pose full face, AM34HAR happy pose ¾ view facing right, AM34SAR sad pose ¾ view facing right) were selected for use as stimuli (Please see Supplemental Materials.). The ¾ pose was selected because it featured the desired emotional expression without appearing to direct the emotion *at* the participant.

Study 3 proceeded as previously described: participants were welcomed, provided with information about the nature of the relationship, provided with an introductory paragraph and photograph of the model, were told that they would see their friend's reaction to the news on the next page, presented the reaction page (photograph), and presented with the dependent measures of: emotion intensity (2 items, $r = .70$, df = 230, $p < .05$; 1 participant did not answer the intensity questions), capitalization (5 items, $\alpha = .91$), down-regulation (5 items, $\alpha = .87$), positive emotion (3 items, $\alpha = .98$), negative emotion (3 items, $\alpha = .97$). The study then concluded as previously described with collection of demographic variables and debrief.

Results

Interpersonal regulation

Using the same analytical strategy as previously reported we found a significant interaction between condition and interpersonal regulation strategy, $F(2,229) = 133.69$, $p < .001$, partial eta$^2 = .539$, observed power = 1.00. Participants in the won-happy expression condition ($M = 4.36$, SE = .12) imagined that they would make efforts to capitalize on their friend's feelings more than did participants in the won-sad expression ($M = 3.72$, SE = .12), and lost-sad expression ($M = 2.20$, SE = .12) conditions, all contrasts p's < .001. This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the lost-sad expression condition ($M = 4.16$, SE = .12), and the won-sad expression condition ($M =$

3.49, SE = .11) imagined that they would make efforts to down-regulate their friend's feelings more than participants in the won-happy expression condition (M = 2.26, SE = .12), all contrasts p's < .001. See Figure 3.

Emotions perceived

Positive emotions were perceived to be equally high in the won-happy expression (M = 4.11, SE = .09) and won-sad expression (M = 4.39, SE = .10) conditions (p = .231), both of which were significantly higher than the lost-sad expression condition (M = 1.20, SE = .07; both p's < .001). Participants perceived negative emotions to be equally low in won-happy (M = 1.10, SE = .05) and won-sad (M = 1.35, SE = .10) expression conditions (p = .251), both of which were significantly lower than the lost-sad expression condition (M = 4.10, SE = .09; both p's < .001).

Study 3 discussion

Study 3 replicated the findings from Studies 1 and 2 with the use of stimuli that had been validated to represent normative expressions of happiness and sadness. The results further made clear that given a positive context, normatively sad facial expressions *can* be interpreted as indicators of positive emotions. When the context was switched, those same sad faces were interpreted as representing negative emotions. This effect of context was not only reflected in the perception of emotion, but also in main effects of higher capitalization in the positive contexts and higher down-regulation in the negative context. However, as hypothesised these effects were moderated by facial expressions. Those who saw sad facial expressions, regardless of the emotion that they thought their "friend" was experiencing, reported higher down-regulation and lower capitalization than those who saw a happy facial expression.

Study 4

Stimuli used thus far were videos and photographs created by asking models to act or pose with happy or sad expressions. It might be that when negative expressions spontaneously come about in positive situations in real-life scenarios that there are subtle differences between those types of expressions and those of a posed nature, and possibly these effects would not hold with more ecologically valid stimuli. Study 4 tested this boundary by using naturalistic photographs of tennis players taken at winning moments, wherein the same athlete, at different moments in time displayed smiles, and crying. Study 4 also broadened the context to include positive and negative moments within a competitive realm. One might expect that the positive emotions experienced in the windfall of winning a trip in Studies 2 and 3, are of a different "flavor" than the pride experienced from winning a long sought after goal. Nonetheless, we expected that interpersonal regulation demonstrated thus far in response to dimorphous expressions was not contingent on what kind of positive emotion is experienced, but rather on the inference of intense positive emotions from the contextual information, combined with the physical display of crying. Therefore, we expected to replicate the findings demonstrated thus far.

Method

Participants

Participants (MTurk, N = 207; 45% male; mean age = 38.28 years, range = 19–72, SD = 12.49; self-reported as 77% White, 8% Asian, 6% Black, 6% Hispanic/Latino, and 3% other) were recruited and compensated as previously described. Of the 216 participants who logged in to the survey, data were excluded for 3 who did not complete the survey, 5 who logged in multiple times, and 1 who declined to participate (total attrition: N = 9, 4%, attrition did not differ by condition, p = .53).

Materials were identical to Study 3 with two exceptions: (1) participants were provided contexts of win and lost-cry in a sports domain, and (2) participants viewed photographs of tennis athletes taken on the court.

Context

In the "won" conditions participants read

> Your friend, a tennis player, has just won the Australian Open. Tennis is not something that you are overly interested in, but winning the Australian Open is something your friend always dreamed of doing since he was a little boy.

In the lost-cry condition the word "won" was changed to "lost."

Stimuli

The photographs featured the tennis players' heads, neck and top of shoulders, and had been used in previous research on dimorphous expressions (Aragón & Bargh, 2017). They were originally selected from

Internet searches for professional tennis players photographed on the court, who displayed smiles and who at other times displayed tears. Female and male models (Rafael Nadal and Victoria Azarenka) were selected as meeting the criteria (Please see Supplemental Materials.).

Study 4 proceeded as previously described: participants were welcomed, the relationship context statement was conveyed, a photograph was presented to introduce the participant to their friend, an orientation to attend the stimuli on the reaction page was given, participants viewed the reaction page (photograph), and we then collected the dependent variables: [(intensity 2 items, $r = .79$, df = 206, $p < .05$), capitalization (5 items, $\alpha = .92$), down-regulation (5 items, $\alpha = .82$), positive emotion (3 items, $\alpha = .98$), and negative emotion (3 items, $\alpha = .97$)], demographic variables, and then a debrief was provided.

Results

Interpersonal regulation

Using the same analytical tests as previously reported, we found a significant interaction between condition and interpersonal regulation strategy, $F(2,204) = 153.28$, $p < .001$, partial eta$^2 = .600$, observed power = 1.00. Participants in the won-smile condition ($M = 4.79$, SE = .12) imagined that they would make efforts to capitalize on their friend's feelings more than participants in the won-cry ($M = 4.20$, SE = .12), and lost-cry ($M = 2.30$, SE = .12) conditions, all contrasts p's < .01. This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the lost-cry condition ($M = 4.31$, SE = .12), and the won-cry condition ($M = 3.10$, SE = .12) imagined that they would make efforts to down-regulate their friend's feelings more than participants in the won-smile condition ($M = 2.52$, SE = .12), all contrasts p's < .01. See Figure 4.

Emotions perceived

Positive emotions were perceived to be equally high in the won-smile ($M = 4.57$, SE = .08) and won-cry ($M = 4.77$, SE = .06) expression conditions ($p = .113$), which were both significantly higher than the lost-cry expression condition ($M = 1.22$, SE = .07; both p's < .001). Participants perceived negative emotions to be equally low in won-smile ($M = 1.12$, SE = .05) and won-cry ($M = 1.16$, SE = .06) expression conditions ($p = 1.00$), which were both significantly lower than the lost-cry expression condition ($M = 4.32$, SE = .10; both p's < .001).

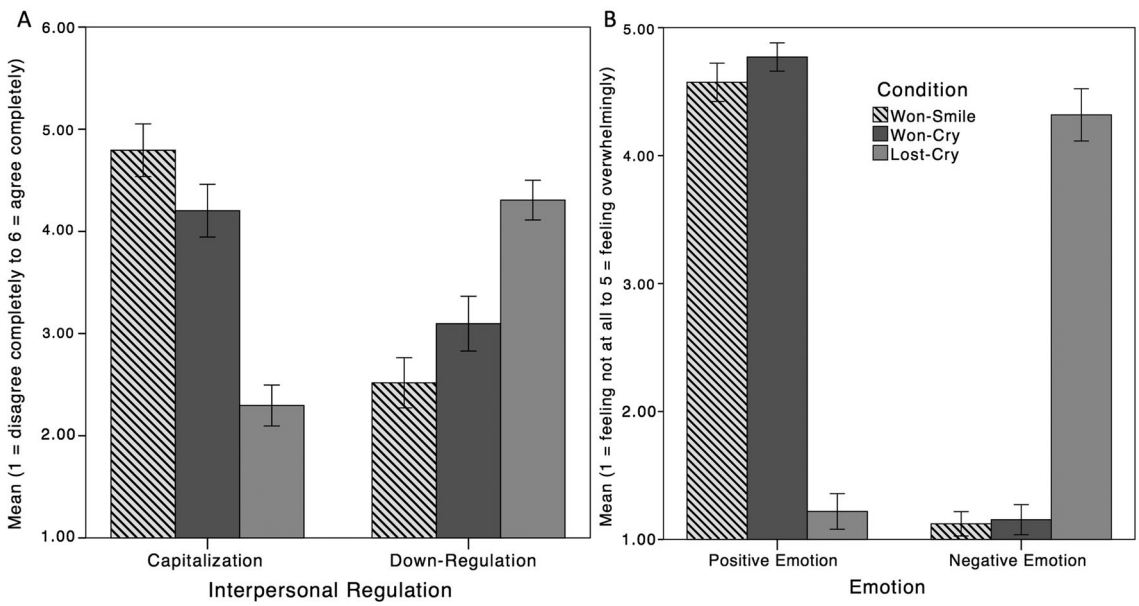

Figure 4. Study 4 replicated Study 3 with ecologically valid photographic stimuli in which tennis professionals displayed smiling and crying during the course of tennis tournaments. Panel A illustrates capitalization and down-regulation responses as reported in the won-happy, won-sad, and lost-sad conditions. Panel B illustrates that in Study 4 "won" conditions were interpreted to bring about positive--not negative emotions, and the "lost" condition was interpreted to bring about negative—not positive emotions. Error bars represent 95% confidence intervals.

Study 4 discussion

Study 4 provided a replication of our findings with ecologically valid stimuli. When real-life smiles or crying occurred in these positive contexts both expressions were interpreted as representing intense happiness, but those distinct expressions evoked distinct reports of interpersonal responsiveness from our participants. Those who saw crying expressions, regardless of the emotion that they thought their "friend" was experiencing, reported higher down-regulation and lower capitalization than those who saw a smiling facial expressions.

These findings demonstrate that these effects are not specific to the interpersonal regulation of emotions that are perceived to have resulted from a windfall of winning a trip in Studies 2 and 3, as they generalised to positive emotions associated with attaining a long sought after goal. This suggests a mechanism that is not tied to a particular discrete emotion. These effects appear to be relevant to the perception of the presence of intense positive emotions, and the physical display of crying.

Interpersonal responsiveness to crying is established from infancy on through adulthood (Bowlby, 1958; Hendriks et al., 2008; Hendriks & Vingerhoets, 2006; Nelson, 2005). The physical act of crying was proposed to be evolutionarily advantageous for its ability to signal vulnerability and a need for support (Hasson, 2009). The signal sent by crying might not be deliberatively considered, but instead automatically processed and the perceiver of such signals might spring into interpersonal regulation behaviours without much forethought. The responsiveness within the dimorphous conditions observed thus far might represent a blend of the two signals that the participants are receiving. One signal is through the inference that their friend is experiencing of a positive emotion, which prompts capitalization responses, and the other is a specific response to the physical display of crying, which prompts automatic down-regulation responses. Therefore, the observance of the physical display of crying might be particularly important in proming interpersonal down-regulation responses.

Study 5

As we conducted and thought through the first four studies the question arose, "Is the presence of the physical expression of crying necessary to elicit down-regulation responses?" It could be that, just the knowledge of another crying in positive or negative situations might be enough information to prompt down-regulation responses. Alternatively, the vividness of actually seeing the expression might be necessary to see the effects observed thus far particularly in the dimorphous conditions where participants are receiving conflicting information, i.e. they are learning of their friend's win, making inferences that the friend is feeling intense positive emotions, and yet are receiving signals that their friend is in need of comfort, which is generally associated with negative emotions. In Study 5 we investigated whether the observation of the physical expression was necessary to bring about the interpersonal down-regulation found thus far in the dimorphous conditions.

If participants report down-regulation strategies when reading about a friend crying in response to good news in the win condition or bad news in the lost-cry condition, then that would be support for the idea that knowledge of a friend is crying, regardless if crying for positive or negative emotions, is enough to elicit such a response. However, if participants cease to report down-regulation in response to learning of their friend crying in a narrative about a win, this would tell us that the presence of the physical display is likely necessary to trigger responsiveness that we saw in the dimorphous conditions. This manipulation of a narrative versus photographic stimuli, parses the effect of seeing the actual expression, from the effect of knowledge of the expression.

In a 2 (conveyance: photograph, narrative)×3 (context-expression: won-smile, won-cry, and lost-cry) design we looked at the unique contribution of conveyance on interpersonal regulation responses. Participants were assigned randomly to view the smiling and crying expressions of their tennis friend in winning or losing moments (the same photographs as in Study 4), or they were assigned to read a narrative about their tennis friend smiling or crying in winning or losing moments.

Method

Participants

Participants [MTurk, $N = 377$; 51% male ; mean age = 34.88 years, range = 18–72, SD = 11.84; self-reported as 82% White, 7% Asian, 5% Black, 4% Hispanic/Latino, and 2% other] were recruited and compensated similarly as previously described. Of the 431 participants who logged into the survey data exclusions

were for the following reasons: 39 did not complete the survey, and 17 logged in multiple times (total attrition: $N = 56$, 13%, attrition did not differ by condition, $p = .31$).

Materials and procedure

Participants were assigned randomly to one condition. The experiment was a 2 (between condition, conveyance: photograph, narrative) × 3 (between condition, context-expression: won-smile, won-cry, and lost-cry) × 2 (within condition, interpersonal regulation: capitalization and down-regulation) design. In the expression conveyance conditions the design was identical to Study 4. In the narrative conveyance conditions, on the reaction page, instead of viewing a photograph, participants read, "*When he won, he was so emotional, he could not help but to smile*." In the won-smile expression condition, the underlined portions read "won" then "smile." In the won-cry condition, "won" then "cry," and in the lost-cry condition "lost" then "cry." (No underline was used in actual stimuli.) Because this manipulation was very subtle, at the end of the study we asked participants, "In the scenario, your friend's reaction to the tennis tournament was described as _____." with response options of (a) smiling, and (b) crying. Participants overwhelmingly answered this question correctly (won-smile 100% correct, won-cry 94% correct, and lost-cry 97% correct).

Participants completed the same measures of intensity (2 items, $r = .77$, df = 376, $p < .05$; one participant did not complete), capitalization (5 items, $\alpha = .92$), down-regulation (5 items, $\alpha = .86$), positive emotion (3 items, $\alpha = .98$), negative emotion (3 items, $\alpha = .96$), demographic variables as previously described. They were also debriefed as previously described.

Results

Interpersonal regulation

Self-reports of interpersonal regulation strategies (capitalization, down-regulation) were analyzed in a repeated-measures, general linear model, with context-expression condition (won-happy expression, won-sad expression, lost-sad expression) and conveyance condition (photograph, narrative) entered as fixed factors. Key to this investigation, there was a significant 3-way interaction between context-expression, mode of conveyance, and interpersonal regulation strategy, $F(2,371) = 11.22$, $p < .001$, partial eta$^2 = .057$, observed power = .992.

The results for the conditions that conveyed expression through photographs closely replicated Study 4. Participants in the won-smile condition ($M = 4.74$, SE = .15) reported higher capitalization than participants in the won-cry ($M = 3.78$, SE = .14), and lost-cry ($M = 2.45$, SE = .14) conditions, all contrasts p's < .001. This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the lost-cry condition ($M = 4.36$, SE = .13), and the won-cry condition ($M = 3.20$, SE = .13) reported higher down-regulation than participants in the won-smile condition ($M = 2.42$, SE = .12), all contrasts p's < .001.

As the 3-way interaction would suggest the pattern of results was significantly different when considering the conditions that conveyed emotional expression through a narrative. In this case, participants in the won-smile condition ($M = 4.69$, SE = .15) and won-cry ($M = 4.63$, SE = .15) conditions did not differ in their reports of capitalization ($p = .992$), and both won conditions were significantly higher than the lost-cry condition ($M = 2.40$, SE = .14), p's < .001. This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the won-smile condition ($M = 2.33$, SE = .13) and won-cry ($M = 2.43$, SE = .13) conditions did not differ in their reports of down-regulation ($p = .999$), and both won conditions were significantly lower than the lost-cry condition ($M = 4.44$, SE = .13), p's < .001. See Figure 5.

Emotions perceived

Positive emotions were perceived to be equally high in the won-smile expression ($M = 4.62$, SE = .07) and won-cry ($M = 4.57$, SE = .07) expression conditions ($p = .917$), which were both significantly higher than the lost-cry expression condition ($M = 1.34$, SE = .06; both p's < .001). Participants perceived negative emotions to be equally low in won-smile ($M = 1.08$, SE = .06) and won-cry ($M = 1.28$, SE = .06) expression conditions ($p = .073$), which were both significantly lower than the lost-cry expression condition ($M = 4.22$, SE = .06; both p's < .001). Means for positive and negative emotions in each of the manipulated conditions (won-smile, won-cry, and lost-cry) did not differ between the conveyance conditions (expression versus narrative conditions, all p's > .107).

Study 5 discussion

Even though within positive contexts people interpreted facial expressions of smiles *or* crying as

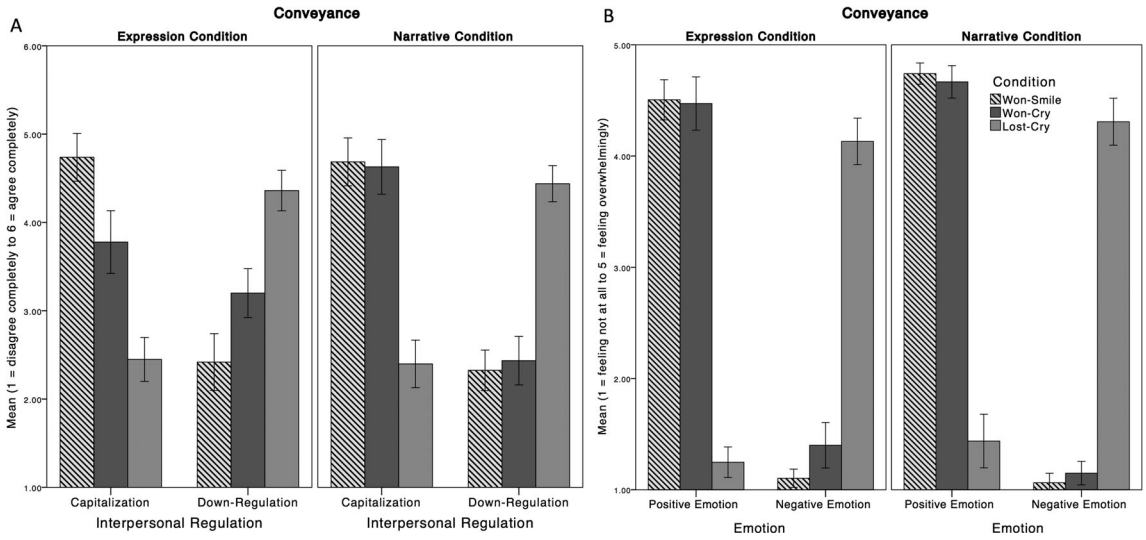

Figure 5. In Study 5 participants were assigned randomly to view either a photographed expression that conveyed their "friend's" reaction to the event, or a narrative that conveyed their "friend's" reaction to the event. Panel A illustrates capitalization and down-regulation responses as reported in the won-happy, won-sad, and lost-sad conditions across both expression, and narrative conveyance conditions. Panel B illustrates that in Study 5 "won" conditions were interpreted to bring about positive--not negative emotions, and "lost" conditions were interpreted to bring about negative—not positive emotions across both expression and narrative conveyance conditions. Error bars represent 95% confidence intervals.

representing positive emotions-- not negative emotions-- participants reported higher capitalization when smiles were presented than when crying was presented, and reported higher down-regulation when crying was presented than when smiles were presented. We further demonstrated that the effect does not appear when the information is conveyed via narrative instead of in videotapes or still pictures of a person. This suggests that mere knowledge that a friend cried does not set off a "down-regulate your partner's emotion" response. It is worth noting that participants in the narrative condition very well could have imagined their friend crying. However, down-regulation responses did not occur. It would seem that possibly participants did not imagine, or did not imagine their friend's crying vividly enough to spur on down-regulation.

Study 6

In Study 6 we attempted to understand why displays interpreted as happiness that include crying might spur on interpersonal down-regulation by close others. If onlookers perceive positive emotion—and the absence of negative emotion, then why do observers respond with down-regulation? Perhaps expressions of crying bring about discomfort for the observers regardless of the valence of emotion that is at hand. Alternatively, and again perhaps additionally, observers may interpret that their friend is experiencing discomfort, even if the discomfort is from positive emotions that have run too high. Another possible mechanism might be the perception that one's friend has lost control over his or her emotions. And yet, another possible mechanism is perhaps, onlookers attempt to down-regulate friends who cry in positive domains because they want to demonstrate that they are caring partners.

To begin to shed light on the mechanisms behind these responses, we replicated Study 4, in which participants imagined their "friend" the tennis athlete, and photographs were shown of the friend's reactions to a win or a loss. The additions in this experiment were questions that directly followed the participants' decisions about their interpersonal responsiveness. Participants were asked about their personal discomfort with their friend's expression, their perceptions of their friend's discomfort during their expression, their sense that their friend had lost control, and their desire to show their friend that they care for the relationship.

Method

Participants

Participants (MTurk, $N = 218$; 100 female, 117 male, 1 did not report gender; mean age = 36.62 years, range = 18–68, SD = 11.50; self-reported as 79% White, 8% Asian, 7% Black, 4% Hispanic/Latino, and 2% other) were recruited and compensated as previously described. Of the 231 participants who logged in to the survey, 6 did not complete the survey, and 7 logged in multiple times and their data were excluded (total attrition: $N = 13$, 6%, attrition did not differ by condition, $p = .23$).

Materials and procedure

Materials were identical to Study 4 with the exception that questions were added directly after the collection of the interpersonal responses of capitalization (5 items, $\alpha = .91$), down-regulation (5 items, $\alpha = .81$). Once the new items, as described below were collected, we again collected the positive emotion (3 items, $\alpha = .97$), and negative emotion (3 items, $\alpha = .98$), intensity ($r = .78$, df = 216) and demographic variables. Participants were thanked for their time and debriefed at the end of the survey.

The new survey items began with the prompt: "I would respond to my friend that way because _____." after which individual phrases were provided. Participant then had the response options of: 1 = *completely disagree*, 2 = *disagree*, 3 = *disagree slightly*, 4 = *agree slightly*, 5 = *agree*, and 6 = *agree completely*.

We asked participants "I would respond to my friend that way because _____" My friend has lost control over his (her) emotions at this moment. My friend is in charge of his (her) emotions at this time (Reversed when scored.). My friend is in control over his (her) emotions at this time (Reversed when scored.). My friend is having a hard time controlling his (her) emotions. These four items were averaged into a "loss of control" variable ($\alpha = .93$). Loss of control variable, descriptive statistics are: won-smile $M = 2.39$, SE = .12; won-cry $M = 3.76$, SE = .14, lost-cry $M = 4.18$, SE = .14.

To capture wanting to demonstrate care, we asked participants "I would respond to my friend that way because _____." With the following phrases: I want my friend to know that I care about him (her). That is what people in a close relationship do for one another. I would want to signal to my friend that I care about our relationship. I would want my friend to know that what is important to him (her) is important to me too. These four items were averaged into one "demonstrate care" variable ($\alpha = .90$). Demonstrate care variable, descriptive statistics are: won-smile $M = 5.10$, SE = .09; won-cry $M = 5.11$, SE = .10, lost-cry $M = 5.12$, SE = .11.

We captured participants' responses in relation to their own and their friend's discomfort with "I would respond to my friend that way because my friend's response made me feel _____" followed by the phrases: "good. I am completely comfortable in this situation." (Reversed when scored.), "good. My friend is completely comfortable in this situation." (Reversed when scored.), "bad. In this situation, I am uncomfortable for myself." and "bad. In this situation, I am uncomfortable for my friend." The four items were averaged into a "discomfort" variable ($\alpha = .90$). Combined discomfort variable, descriptive statistics are: won-smile $M = 1.59$, SE = .07; won-cry $M = 2.03$, SE = .12, lost-cry $M = 4.52$, SE = .13. Please note, an attempt was made to separate these into personal discomfort ($r = .799$, $p < .001$, df = 216; won-smile $M = 1.60$, SE = .08; won-cry $M = 1.94$, SE = .11, lost-cry $M = 4.26$, SE = .14) and friend's discomfort ($r = .872$, $p < .001$, df = 216; won-smile $M = 1.57$, SE = .08; won-cry $M = 2.11$, SE = .13, lost-cry $M = 4.78$, SE = .13) variables, but they were too highly correlated, $r = .924$, $p < .0001$, df = 216, to be entered simultaneously into linear models without creating issues of colinearity. These variables are presented separately for zero-order correlations and means are provided in Table A4.

Results

Interpersonal regulation

Using the same analytical tests as previously reported, we again found a significant interaction between condition and interpersonal regulation strategy, $F(2,215) = 162.72$, $p < .001$, partial eta$^2 = .602$, observed power = 1.00. Participants in the won-smile condition ($M = 4.64$, SE = .12) imagined that they would make efforts to capitalize on their friend's feelings more than participants in the won-cry ($M = 4.00$, SE = .13), and lost-cry ($M = 2.37$, SE = .13) conditions, all contrasts p's < .001. This pattern reversed when considering interpersonal down-regulation of emotion. Participants in the lost-cry condition ($M = 4.22$, SE = .11), and the won-cry condition ($M = 3.31$, SE = .11) imagined that they would make efforts to down-regulate their friend's feelings more than participants in the won-smile condition ($M = 2.26$, SE = .10), all contrasts p's < .02.

Emotions perceived

Positive emotions were perceived to be equally high in the won-smile ($M = 4.49$, SE = .07) and won-cry ($M = 4.21$, SE = .12) expression conditions ($p = .225$), which were both significantly higher than the lost-cry expression condition ($M = 1.30$, SE = .08; both p's < .001). Participants perceived negative emotions to be lowest in won-smile condition ($M = 1.08$, SE = .04), next lowest in the won-cry ($M = 1.44$, SE = .11) condition ($p < .02$), which were both significantly lower than the lost-cry expression condition ($M = 4.31$, SE = .09; both p's < .001).

Mediation analysis

See Table A4 for zero-order correlations and means for variables used in the model. Using Hayes Process (Hayes, 2013) syntax in SPPS, we conducted a mediation analysis to test if the differences observed between condition in capitalization (first analysis) or down-regulation (second analysis) could be explained by (a) wanting to demonstrate care for one's friend, (b) discomfort for both the participant and the friend, and (c) the impression that the friend has lost control over his or her emotions. All three proposed mediators were entered simultaneously as mediators in the models. Process syntax dummy coded condition, with our specifications of the won-smile condition as the reference (0,0), the won-cry condition as the first contrast (1,0), and the lost-cry condition as the second contrast (0,1).

The first analysis tested capitalization responses. Only the path for discomfort was significant in explaining differences observed between conditions in capitalization responses. The *a path* showed that discomfort was significantly higher in the won-cry condition ($b = .439$, SE = .15, $p = .003$), and lost-cry conditions ($b = 2.936$, SE = .15, $p < .0001$) than in the won-smile condition. The *b path* showed that discomfort was significantly related to reduced capitalization responses ($b = -.357$, SE = .08, $p < .0001$). The c path showed a significant relationship between condition and capitalization responses with capitalization responses lower in the won-cry ($b = -.639$, SE = .17, $p < .001$) and lost-cry ($b = -2.27$, SE = .17, $p < .0001$) conditions, $F(2, 215) = 89.57$, $R^2 = .46$ than the won-smile condition. The c′ path indicated a partial mediation as the pathways were still significantly lower in the won-cry ($b = -.521$, SE = .17, $p = .003$; lower limit confidence interval LLCI = −.310, and upper limit confidence interval ULCI = −.059) and lost-cry conditions ($b = -1.28$, SE = .27, $p < .0001$), $F(2, 212) = 11.76$, $R^2 = .05$; LLCI = −1.522, ULCI = −.577), than in the won-smile condition. The significant indirect pathway explained a portion of the observed effect. The indirect path through discomfort in the won-cry condition (contrasted against the won-smile condition) was significant, lower limit confidence interval (LLCI) = −.310, and upper limit confidence interval (ULCI) = −.059, and the indirect path through discomfort in the lost-cry condition (contrasted against the won-smile condition) was also significant, LLCI = −1.522, ULCI = −.577.

The second analysis tested down-regulation responses. Again, only the path for discomfort was significant in explaining differences observed between conditions in down-regulation responses. The *a path* showed that reported discomfort in the won-cry condition ($b = .439$, SE = .15, $p = .003$), and lost-cry conditions ($b = 2.936$, SE = .15, $p < .0001$) was significantly higher than in the won-smile condition. The *b path* showed that discomfort was significantly related to greater down-regulation responses ($b = .280$, SE = .07, $p = .0001$). The c path showed a significant relationship between condition and down-regulation responses with down-regulation responses higher in the won-cry ($b = 1.054$, SE = .15, $p < .0001$) and lost-cry ($b = 1.962$, SE = .15, $p < .0001$) conditions, $F(2, 215) = 89.25$, $R^2 = .45$. The c′ path indicated a partial mediation as the pathways were still significantly higher in the won-cry condition ($b = .808$, SE = .15, $p < .0001$; LLCI = .040, ULCI = .257) and lost-cry condition ($b = .977$, SE = .24, $p < .0001$), $F(2, 212) = 15.61$, $R^2 = .07$; LLCI = .369, ULCI = 1.305). The significant indirect pathway explained a portion of the observed effect. The indirect path through discomfort in the won-cry condition (contrasted against the won-smile condition) was significant, LLCI = .040, ULCI = .257, and the indirect path through discomfort in the lost-cry condition (contrasted against the won-smile condition) was also significant, LLCI = .369, ULCI = 1.305.

Study 6 discussion

Study 6 was a replication of Study 4 in which additional proposed mediators were measured and examined. We considered wanting to demonstrate care to one's friend, feelings of discomfort in the situation for both one's self and one's friend, and judgments that the friend had lost control of his or her feelings. The mediation analysis showed the only

significant pathway to be through the composite variable of feelings of discomfort experienced by one's self and one's partner. However, this significant pathway should be interpreted with caution because not only did it not fully account for the differences in interpersonal regulation that we see between conditions, but also the discomfort variable had very low reported means in the dimorphous condition (see Table A4; $M = 2.03$, SE = .12, on a 1 = completely disagree to 6 = completely agree scale). Since the data are bounded by the low end of the scale, those few responses that fell at higher ranges might have driven the outcomes of the mediation analyses.

In all three conditions participants reported equal desires to demonstrate care to their friend, thus it could not explain the differences between conditions. However wanting to demonstrate care was related to capitalization responses in the won-smile and won-cry conditions, and it was related to down-regulation in the lost-cry condition. Even though demonstrating care was not an explanation for the differences in responses between conditions, it was related to behaviours demonstrated across all conditions.

Perhaps, as we previously suggested, the signal of crying spurs on care without much pre-action thought as to why one would need to provide soothing to another who is in celebration. If so, answers to questions as to why one would behave this way might actually reflect *post hoc* reasoning. In support of this idea was that other than a tenuous relationship with discomfort, there were no viable explanations for why people responded in the way that they do to happiness expressed through crying. For example, when considering that one's friend has lost control over his or her emotions, in the won-smile condition, and the lost-cry-cry condition perceptions of a loss of control were related to down-regulation responses. However, perceptions of loss of control were not related to down-regulation responses in the dimorphous won-cry condition. Likewise, demonstrating care was related to down-regulation behaviours in both the won-smile, and lost-cry conditions, but not in the dimorphous won-cry condition. Even intensity, our originally hypothesised mediator of down-regulation responses to happy tears, was not related to down-regulation in the won-cry condition, $r = -.072$, $df = 65$, $p = .55$, but was related to down regulation in the lost-cry condition, $r = .411$, $df = 68$, $p < .001$. Unlike past research that has found clearer reasons for interpersonal responsiveness to crying, in these studies there were no conclusive reasons provided by participants for why they would respond in the way that they do to the dimorphous expressions. The monomorphous expressions on the other hand showed coherent relationships between participants' responses and their reasons for their responses.

We made an effort to understand the mechanisms at play during interpersonal responsiveness in our studies, but did not find evidence that fully explained the pattern of responses observed. Future research should continue work on identifying and teasing apart the undoubtedly complicated mechanisms involved in interpersonal responsiveness in regard to dimorphous expressions.

General discussion

In a prior paper the concept of dimorphous expressions of emotion was introduced and compared with the concept of monomorphous expressions (Aragón et al., 2015). Monomorphous expressions are thought to arise from a singular emotional experience, and unambiguously communicate the experienced emotion in the absence of other situational cues. Dimorphous expressions also arise from a single emotional experience and include not just the often-suggested classic (Ekman & Friesen, 1971) expressions of emotion but also facial expressions that, in the absence of situational cues would be taken to represent a the opposite valence of emotion. Expressing joy with tears and smiles is an example of this. As demonstrated here, when provided with minimal context, people recognised the dimorphous expression representations of emotional experiences that were consistent with the context in which they arose.

Previous research into the dimorphous expression of emotion has focused squarely on reported experiences of dimorphous expressions, behavioural measures of dimorphous expressions, on the interpretation of observed dimorphous expressions, and on individual differences in tendencies to express emotions dimorphously, and on the functions that dimorphous expressions may serve (Aragón, 2016, 2017; Aragón & Bargh, 2017; Aragón et al., 2015). In the present paper we took a new perspective. We asked how social partners interpersonally respond to these expressions. The results of the six studies reported here provide initial answers to this question.

Our results were consistent with past research showing that crying in positive contexts suggests the presence of happiness and not sadness

(Aragón, 2016, 2017; Aragón & Bargh, 2017; Fernández-Dols & Ruiz-Belda, 1995). These finding are consistent with the idea that people interpret facial expressions in context (Carroll & Russell, 1996). Also as past research has indicated, monomorphously expressed happiness led to participants reporting predominant capitalization responses (Gable et al., 2006; Gable & Reis, 2010; Gable et al., 2004). Dimorphously expressed happiness through tears led our participants to report attenuated capitalization responses and amplified down-regulation responses relative to monomorphous expressions of happiness. And, when participants were assigned randomly to respond to a friend's crying in sadness, their responses indicated predominant down-regulation.

In this paper we sought to show a potential function of dimorphous displays of emotion, as displays of emotion are thought to serve a communicative function (Fridlund & Russell, 2006). Important to the potential social functions of dimorphous expressions, observers' reports of their likely interpersonal responsiveness differed as a function of monomorphous and dimorphous expressions of positive emotion. Dimorphous expressions of positive emotions, might serve emotion regulation functions by, essentially, calling on close relational partners who care for the expresser's welfare, to help in down-regulating the emotion being experienced.

The contributions of these six studies were that they replicated, broadened the scope, and identified a boundary condition for the observed effects. The boundary condition being that simply learning of a partner crying in joy was not sufficient to prompt a down-regulation response. This is consistent with the idea that the presence of the expression is important in the signalling for help (Hasson, 2009). The necessary proviso of the presence of the expression might suggest that this response is triggered by the physical display of crying. Another point worth mentioning is that visual signals of crying are used in these studies, but auditory stimuli of infant cries are also thought to bring about responsive care behaviours (Zeifman, 2001). Given this point, one might imagine that hearing a friend crying about good news within a telephone conversation might bring about interpersonal down-regulation strategies as well. Future research might investigate this possibility.

Past research, by Hendriks et al. (2008) presented verbal vignettes to participants, and they reported reduced down-regulation responses of attention and comfort, to tears that came about within positive contexts (i.e. one who has won a prize, award, or a new parent) relative to negative contexts (i.e. one at a funeral, car crash, and who has broken an expensive vase). When considering just our narrative condition, our results appear to replicate Hendriks et al. (2008), with higher down-regulation responsiveness in the lost-cry than the win-cry conditions. However, this was not an indication of an absence of responsiveness. We showed interpersonal responsiveness was present for those crying in positive contexts, but in the case of narrative stimuli, it was in the form of capitalization. Interpersonal responsiveness for tears of joy is present; it is just of a different nature than what was tested by Hendriks et al. (2008).

In some ways, comforting one who is experiencing intense positive emotion is a counter-rational response. Why would one "comfort" another who is not suffering? Past research has shown that crying is not only a signal for comfort but it might also serve to reduce aggressive tendencies toward the crier (Hendriks et al., 2008). Perhaps upon winning either a contest or tournament as depicted in these studies, a person opens themselves up to jealous attacks. Perhaps the display of crying comes about not only as a reflection of powerful emotions, or elicitor of comfort, but also as a display of humility that wards off attacks from others. Another interesting idea that has been put forth is perhaps crying promotes a sense of intimacy and closeness, a sharing of an honest signal of emotionality that portrays the expresser as genuine (for discussion see, Vingerhoets, 2013). Thus, perhaps crying in a positive context promotes a genuine sharing of the experience that promotes interpersonal bonding.

A limitation of this work is that our investigations did not involve creating real-life scenarios between friends in which these types of interpersonal emotion regulations could occur. Future research might look for these responses within real-life instances of tears within positive contexts. Another limitation is that this research only addresses responses to positive emotions displayed with crying and sad faces. Future investigations might also test if social responses differ when other emotions are displayed dimorphously versus monomorphously, such as when an individual displays nervous laughter (dimorphous) versus nervousness displayed with anxious facial expressions (monomorphous).

Here we have examined two distinct facial expressions one of smiling and one of crying in combination with two different situations, one in which

people have encountered good or bad fortune. In the case of smiling versus crying expressions in good fortune contexts, participants reached similar conclusions of underlying, intensely positive emotional state. Thus in our studies, one previously considered mechanism of down-regulation in response to crying, that is, perceptions of sadness (Provine, Krosnowski, & Brocato, 2009), most likely is not the driving force behind the interpersonal down-regulation strategies in the dimorphous conditions. Social responses in all conditions were related to desires to show that one is a good relationship partner. Reduced capitalization responses, and greater down-regulation responses when participants were faced with crying expressions were in part explained by imagined discomfort for both one's self and one's partner. This fits with the idea that people may be motivated to help others, both because they are empathetically uncomfortable for their friend and his or her discomfort, but also for the egoistic discomfort that they personally feel to be in such a situation (Batson, O'Quin, Fultz, Vanderplas, & Isen, 1983).

Our findings fit well, with other recently emerging emotion research also suggesting that facial expressions are read in conjunction with other information available to perceivers to make sense of what another person is feeling including situations (Crivelli, Russell, Jarillo, & Fernandez-Dols, 2016, 2017). It is further worth noting that even processes described here may simplify how people judge what other people are likely feeling as recent work suggests that not only do facial expressions and situations combine to influence this process but so too do perceivers own felt emotions play a important role in determining how well we understand others (Aragón, Sharer, Bargh, & Pineda, 2014), and how others' emotions are read (Clark, Von Culin, Clark-Polner, & Lemay, 2017; Overall, Fletcher, Simpson, & Fillo, 2015). All this likely occurs in the motivated service of the perceivers' efforts to reach their social goals and build their own social relationships. In regard to dimorphous theory, these findings add to the functional purpose of such counter-intuitive displays of emotion.

Notes

1. Detailed results for all studies are reported in Tables A1–A4.
2. Dimorphous expressions of negative emotion appear to exist (e.g. smiles when sad). However, we did not investigate smiles expressed upon losing in this work, because such displays in these particular contexts could represent motivations or emotions that are outside the scope of this investigation (e.g. self-presentation concerns).

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No potential conflict of interest was reported by the authors.

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Appendix

Table A1. Detailed analyses for Studies 1 through 4.

	Omnibus											Pairwise comparisons		
Analysis	df	test statistic	sig.	partial eta squared	observed power	factor 1	*M* (SE)	factor 2	*M* (SE)	factor 3	*M* (SE)	Factors 1 & 2	Factors 1 & 3	Factors 2 & 3
Study 1														
Main analysis of regulation response														
emotional expression condition	(1, 147)	$F = 1.70$	$p = .194$	.011	.254	monomorphous	3.36 (.07)	dimorphous	3.49 (.07)	–	–	$p = .194$	–	–
interpersonal emotion regulation	(1, 147)	$F = 18.28$	$p < .001$	.111	.989	capitalization	3.74 (.09)	down-regulation	3.11 (.09)	–	–	$p < .001$	–	–
emotional expression x interpersonal regulation	(1, 147)	$F = 24.97$	$p < .001$	.145	.999									
pairwise capitalization						monomorphous	4.04 (.12)	dimorphous	3.44 (.12)	–	–	$p = .002$	–	–
pairwise down-regulation						monomorphous	2.67 (.13)	dimorphous	3.54 (.13)	–	–	$p < .001$	–	–
Intensity of emotion														
emotional expression condition	(147)	$t = 1.36$	$p = .176$			monomorphous	4.43 (.08)	dimorphous	4.58 (.08)	–	–	$p = .176$	–	–
Study 2														
Main analysis of regulation response														
emotional expression condition	(1, 148)	$F = .770$	$p = .382$	.005	.141	monomorphous	3.30 (.07)	dimorphous	3.40 (.08)	–	–	$p = .382$	–	–
interpersonal emotion regulation	(1, 148)	$F = 38.29$	$p < .001$	.206	1.00	capitalization	3.82 (.10)	down-regulation	2.88 (.08)	–	–	$p < .001$	–	–
emotional expression x interpersonal regulation	(1, 148)	$F = 21.42$	$p < .001$	.126	.996									
pairwise capitalization						monomorphous	4.12 (.14)	dimorphous	3.51 (.14)	–	–	$p = .006$	–	–
pairwise down-regulation						monomorphous	2.49 (.12)	dimorphous	3.28 (.12)	–	–	$p < .001$	–	–
Emotion perceived														
positive emotion	(148)	$t = .71$	$p = .477$			monomorphous	4.56 (.07)	dimorphous	4.47 (.10)	–	–	$p = .477$	–	–
negative emotion	(148)	$t = .28$	$p = .779$			monomorphous	1.16 (.06)	dimorphous	1.19 (.07)	–	–	$p = .779$	–	–
Intensity of emotion														
context-emotional expression condition	(148)	$t = 1.57$	$p = .119$			monomorphous	4.37 (.09)	dimorphous	4.55 (.07)	–	–	$p = .119$	–	–

(*Continued*)

Table A1. Continued.

	Omnibus											Pairwise comparisons		
Analysis	df	test statistic	sig.	partial eta squared	observed power	factor 1	*M* (SE)	factor 2	*M* (SE)	factor 3	*M* (SE)	Factors 1 & 2	Factors 1 & 3	Factors 2 & 3
Study 3														
Main analysis of regulation response														
context-emotional expression condition	(2, 229)	$F = 7.08$	$p = .001$	.058	.927	won-happy expression	3.31 (.08)	won-sad expression	3.59 (.08)	lost-sad expression	3.18 (.08)	$p = .041$	$p = .547$	$p < .001$
interpersonal emotion regulation	(1, 229)	$F = 1.95$	$p = .164$	.008	.284	capitalization	3.43 (.07)	down-regulation	3.29 (.07)	–	–	$p < .001$	–	–
context-emotional expression x interpersonal regulation	(2, 229)	$F = 133.69$	$p < .001$	.539	1.00									
pairwise capitalization						won-happy expression	4.36 (.12)	won-sad expression	3.72 (.12)	lost-sad expression	2.20 (.12)	$p < .001$	$p < .001$	$p < .001$
pairwise down-regulation						won-happy expression	2.26 (.12)	won-sad expression	3.49 (.11)	lost-sad expression	4.16 (.12)	$p < .001$	$p < .001$	$p < .001$
Emotion perceived														
positive emotion	(2, 229)	$F = 393.98$	$p < .001$			won-happy expression	4.11 (.09)	won-sad expression	4.39 (.10)	lost-sad expression	1.20 (.07)	$p = .231$	$p < .001$	$p < .001$
negative emotion	(2, 229)	$F = 417.81$	$p < .001$			won-happy expression	1.10 (.05)	won-sad expression	1.35 (.10)	lost-sad expression	4.10 (.09)	$p = .251$	$p < .001$	$p < .001$
Intensity of emotion														
context-emotional expression condition	(2, 229)	$F = 44.06$	$p < .001$			won-happy expression	3.62 (.08)	won-sad expression	4.58 (.07)	lost-sad expression	4.02 (.07)	$p < .001$	$p < .001$	$p < .001$
Study 4														
Main analysis of regulation response														
context-emotional expression condition	(2, 204)	$F = 6.21$	$p = .002$	.057	.890	won-smile expression	3.66 (.08)	won-cry expression	3.65 (.08)	lost-cry expression	3.30 (.08)	$p = 1.00$	$p = .006$	$p = .009$
interpersonal emotion regulation	(1, 204)	$F = 19.74$	$p < .001$	.088	.993	capitalization	3.77 (.07)	down-regulation	3.31 (.07)	–	–	$p < .001$	–	–
context-emotional expression x interpersonal regulation	(2, 204)	$F = 153.28$	$p < .001$	.600	1.00									
pairwise capitalization						won-smile expression	4.79 (.12)	won-cry expression	4.20 (.12)	lost-cry expression	2.30 (.12)	$p = .006$	$p < .001$	$p < .001$
pairwise down-regulation						won-smile expression	2.52 (.12)	won-cry expression	3.10 (.12)	lost-cry expression	4.31 (.12)	$p = .006$	$p < .001$	$p < .001$
Emotion perceived														
positive emotion	(2, 204)	$F = 863.90$	$p < .001$			won-smile expression	4.57 (.08)	won-cry expression	4.77 (.06)	lost-cry expression	1.22 (.07)	$p = .113$	$p < .001$	$p < .001$
negative emotion	(2, 204)	$F = 631.32$	$p < .001$			won-smile expression	1.12 (.05)	won-cry expression	1.16 (.06)	lost-cry expression	4.32 (.10)	$p = 1.00$	$p < .001$	$p < .001$
Intensity of emotion														
context-emotional expression condition	(2, 204)	$F = 10.90$	$p < .001$			won-smile expression	4.21 (.11)	won-cry expression	4.78 (.05)	lost-cry expression	4.51 (.08)	$p < .001$	$p = .048$	$p = .090$

All pairwise comparisons have been Bonferroni corrected.

Table A2. Detailed analyses for Study 5.

	Omnibus										Pairwise comparisons		
Analysis	df	test statistic	sig.	partial eta squared	observed power	factor 1	*M* (SE)	factor 2	*M* (SE)	factor 3	*M* (SE)	Factors 1 & 2	Factors 1 & 3	Factors 2 & 3
Study 5														
Main analysis of regulation response														
context-expression condition	(2, 371)	$F = 1.12$	$p = .327$	.006	.247	won-smile expression	3.54 (.07)	won-cry expression	3.51 (.07)	lost-cry expression	3.41 (.06)	$p = .981$	$p = .340$	$p = .625$
conveyance condition	(1, 371)	$F = .01$	$p = .943$	.000	.051	expression	3.49 (.05)	narrative	3.49 (.05)	–	–	$p = .943$	–	–
interpersonal emotion regulation	(1, 371)	$F = 49.63$	$p < .001$	.118	1.00	capitalization	3.78 (.06)	down-regulation	3.20 (.05)	–	–	$p < .001$	–	–
context-expression x conveyance	(2, 371)	$F = .21$	$p = .812$	.001	.083									
pairwise expression condition						won-smile expression	3.58 (.10)	won-cry expression	3.49 (.09)	lost-cry expression	3.41 (.09)	$p = .984$	$p = .709$	$p = .986$
pairwise narrative condition						won-smile expression	3.51 (.09)	won-cry expression	3.53 (.10)	lost-cry expression	3.42 (.09)	$p = 1.00$	$p = .983$	$p = .946$
context-expression x interpersonal regulation	(2, 371)	$F = 256.56$	$p < .001$	.580	1.00									
pairwise capitalization						won-smile expression	4.71 (.10)	won-cry expression	4.20 (.10)	lost-cry expression	2.42 (.10)	$p = .006$	$p < .001$	$p < .001$
pairwise down-regulation						won-smile expression	2.37 (.09)	won-cry expression	2.82 (.09)	lost-cry expression	4.40 (.09)	$p = .006$	$p < .001$	$p < .001$
conveyance x interpersonal regulation	(1, 371)	$F = 9.49$	$p = .002$	.025	.867									
pairwise capitalization						expression condition	3.66 (.08)	narrative condition	3.90 (.08)	–	–	$p = .254$	–	–
pairwise down-regulation						expression condition	3.33 (.07)	narrative condition	3.07 (.07)	–	–	$p = .099$	–	–
context-expression x conveyance x interpersonal regulation	(2, 371)	$F = 11.22$	$p < .001$	.057	.992									
expression condition														
pairwise capitalization						won-smile expression	4.74 (.15)	won-cry expression	3.78 (.14)	lost-cry expression	2.45 (.14)	$p < .001$	$p < .001$	$p < .001$
pairwise down-regulation						won-smile expression	2.42 (.13)	won-cry expression	3.20 (.13)	lost-cry expression	4.36 (.13)	$p < .001$	$p < .001$	$p < .001$
narrative condition														
pairwise capitalization						won-smile expression	4.69 (.15)	won-cry expression	4.63 (.15)	lost-cry expression	2.40 (.14)	$p = .992$	$p < .001$	$p < .001$

(*Continued*)

Table A2. Continued.

	Omnibus											Pairwise comparisons		
Analysis	df	test statistic	sig.	partial eta squared	observed power	factor 1	*M* (SE)	factor 2	*M* (SE)	factor 3	*M* (SE)	Factors 1 & 2	Factors 1 & 3	Factors 2 & 3
pairwise down-regulation						won-smile expression	2.33 (.13)	won-cry expression	2.43 (.13)	lost-cry expression	4.44 (.13)	$p = .999$	$p < .001$	$p < .001$
Emotion perceived														
positive emotion														
context-expression condition	(2, 371)	$F = 852.89$	$p < .001$	.821	1.00	won-smile expression	4.62 (.07)	won-cry expression	4.57 (.07)	lost-cry expression	1.34 (.06)	$p = .917$	$p < .001$	$p < .001$
conveyance condition	(1, 371)	$F = 7.52$	$p = .006$	.020	.781	expression	3.41 (.05)	narrative	3.62 (.05)	–	–	$p = .006$	–	–
context-expression x conveyance	(2, 371)	$F = .035$	$p = .966$	< .001	.055									
pairwise won smile expression						expression	4.51 (.10)	narrative	4.74 (.09)	–	–	$p = .216$	–	–
pairwise won cry expression						expression	4.47 (.09)	narrative	4.67 (.10)	–	–	$p = .366$	–	–
pairwise lost cry expression						expression	2.21 (.05)	narrative	2.17 (.05)	–	–	$p = .351$	–	–
negative emotion														
context-expression condition	(2, 371)	$F = 911.89$	$p < .001$	.831	1.00	won-smile expression	1.08 (.06)	won-cry expression	1.28 (.06)	lost-cry expression	4.22 (.06)	$p = .073$	$p < .001$	$p < .001$
conveyance condition	(1, 371)	$F = .307$	$p = .580$	.001	.086	expression	3.41 (.05)	narrative	3.62 (.05)	–	–	$p = .580$		
context-expression x conveyance	(2, 371)	$F = 3.34$	$p = .036$	.018	.630									
pairwise won smile expression						expression	1.10 (.09)	narrative	1.06 (.08)	–	–	$p = .982$	–	–
pairwise won cry expression						expression	1.40 (.08)	narrative	1.15 (.09)	–	–	$p = .107$	–	–
pairwise lost cry expression						expression	4.13 (.08)	narrative	4.31 (.08)	–	–	$p = .326$	–	–
Intensity of emotion														
context-expression condition	(2, 371)	$F = 11.00$	$p < .001$	.056	.991	won-smile expression	4.26 (.07)	won-cry expression	4.69 (.07)	lost-cry expression	4.40 (.06)	$p < .001$	$p = .342$	$p = .006$
conveyance condition	(1, 371)	$F = 3.54$	$p = .061$	.009	.467	expression	4.38 (.05)	narrative	4.52 (.05)	–	–	$p = .061$	–	–
context-expression x conveyance	(2, 371)	$F = 3.04$	$p = .049$	.016	.587									
pairwise won smile expression						expression	4.15 (.10)	narrative	4.38 (.09)	–	–	$p = .209$	–	–
pairwise won cry expression						expression	4.75 (.09)	narrative	4.63 (.10)	–	–	$p = .750$	–	–
pairwise lost cry expression						expression	4.25 (.10)	narrative	4.55 (.10)	–	–	$p = .407$	–	–

All pairwise comparisons have been Bonferroni corrected.

Table A3. Detailed analyses for Study 6.

	Omnibus										Pairwise comparisons		
Analysis	df	test statistic	sig.	partial eta squared	observed power	factor 1	*M* (SE)	factor 2	*M* (SE)	factor 3	*M* (SE)	Factors 1 & 2	Factors 1 & 3	Factors 2 & 3
Study 6														
Main analysis of regulation response														
context-emotional expression condition	(2, 215)	$F = 5.16$	$p = .0061$	.046	.823	won-smile expression	3.45 (.07)	won-cry expression	3.67 (.08)	lost-cry expression	3.30 (.08)	$p = .171$	$p = .477$	$p = .002$
interpersonal emotion regulation	(1, 215)	$F = 17.71$	$p < .001$	.076	.987	capitalization	3.67 (.07)	down-regulation	3.27 (.06)	–	–	$p < .001$	–	–
context-emotional expression x interpersonal regulation	(2, 215)	$F = 162.72$	$p < .001$	.602	1.00									
pairwise capitalization						won-smile expression	4.64 (.12)	won-cry expression	4.00 (.13)	lost-cry expression	2.37 (.13)	$p < .001$	$p < .001$	$p < .001$
pairwise down-regulation						won-smile expression	2.26 (.10)	won-cry expression	3.31 (.11)	lost-cry expression	4.22 (.11)	$p < .001$	$p < .001$	$p < .001$
Emotion perceived														
positive emotion	(2, 215)	$F = 377.04$	$p < .001$			won-smile expression	4.49 (.07)	won-cry expression	4.21 (.12)	lost-cry expression	1.30 (.08)	$p = .225$	$p < .001$	$p < .001$
negative emotion	(2, 215)	$F = 473.48$	$p < .001$			won-smile expression	1.08 (.04)	won-cry expression	1.44 (.11)	lost-cry expression	4.31 (.09)	$p = .012$	$p < .001$	$p < .001$
Intensity of emotion														
context-emotional expression condition	(2, 215)	$F = 17.89$	$p < .001$			won-smile expression	3.95 (.10)	won-cry expression	4.68 (.06)	lost-cry expression	4.21 (.09)	$p < .001$	$p = .348$	$p < .001$
Proposed Mediators														
Personal Discomfort	(2, 215)	$F = 164.87$	$p < .001$			won-smile expression	1.60 (.08)	won-cry expression	1.94 (.11)	lost-cry expression	4.26 (.14)	$p = .091$	$p < .001$	$p < .001$
Friend's Discomfort	(2, 215)	$F = 208.67$	$p < .001$			won-smile expression	1.57 (.08)	won-cry expression	2.11 (.13)	lost-cry expression	4.78 (.13)	$p = .002$	$p < .001$	$p < .001$
Combined Discomfort	(2, 215)	$F = 176.89$	$p < .001$			won-smile expression	1.59 (.07)	won-cry expression	2.03 (.12)	lost-cry expression	4.52 (.13)	$p = .009$	$p < .001$	$p < .001$
Friend's Loss of Control	(2, 215)	$F = 66.79$	$p < .001$			won-smile expression	2.39 (.12)	won-cry expression	3.76 (.14)	lost-cry expression	4.18 (.14)	$p < .001$	$p < .001$	$p < .098$
Demonstrate Care	(2, 215)	$F = .012$	$p = .983$			won-smile expression	5.10 (.09)	won-cry expression	5.11 (.10)	lost-cry expression	5.12 (.11)	$p = 1.00$	$p = 1.00$	$p = 1.00$

All pairwise comparisons have been Bonferroni corrected.

Table A4. Study 6, zero-order correlations and means for dependend variables and potential mediators.

	Capitalization	Down-Regulation	Demonstrate Care	Discomfort	Personal Discomf.	Friend's Discomf.	Loss of Control	Mean (SD)
Won-Smile Condition								
Capitalization	1	−.247*	.536***	−.312**	−.305**	−.308**	−.037	4.64 (.99)
Down-Regulation		1	−.285*	.464***	.505***	.407***	.286**	2.26 (.77)
Demonstrate Care			1	−.414***	−.393***	−.422***	−.228*	5.10 (.84)
Discomfort				1	.983***	.983***	.214	1.59 (.67)
Personal Discomf.					1	.933***	.241*	1.60 (.68)
Friend's Discomf.						1	.179	1.57 (.68)
Loss of Control							1	2.39 (1.12)
Won-Cry Condition								
Capitalization	1	−.085	.418***	−.276*	−.215	−.308**	.083	4.00 (1.23)
Down-Regulation		1	.131	.346**	.307*	.353**	.061	3.31 (1.03)
Demonstrate Care			1	−.241*	−.196	−.262*	.265*	5.11 (.80)
Discomfort				1	.953***	.963***	.085	2.03 (.98)
Personal Discomf.					1	.835***	.091	1.94 (.96)
Friend's Discomf.						1	.073	2.11 (1.08)
Loss of Control							1	3.76 (1.16)
Lost-Cry Condition								
Capitalization	1	.162	−.016	−.497***	−.411**	−.514***	−.223	2.37 (.89)
Down-Regulation		1	−.563***	.076	.069	.071	.291*	4.22 (.87)
Demonstrate Care			1	.029	−.037	.099	.169*	5.13 (.91)
Discomfort				1	.934***	.915***	.527***	4.52 (1.03)
Personal Discomf.					1	.709***	.411**	4.26 (1.18)
Friend's Discomf.						1	.573***	4.78 (1.05)
Loss of Control							1	4.18 (1.15)
Entire Sample								
Capitalization	1	−.474***	.236***	−.694***	−.654***	−.705***	−.354***	3.74 (1.41)
Down-Regulation		1	.109	.620***	.591***	.623***	.493***	3.20 (1.20)
Demonstrate Care			1	−.094	−.103	−.083	−.052	5.11 (.84)
Discomfort				1	.979***	.983***	.494***	2.63 (1.56)
Personal Discomf.					1	.924***	.469***	2.53 (1.50)
Friend's Discomf.						1	.499***	2.73 (1.67)
Loss of Control							1	3.38 (1.38)

*$p < .05$, **$p < .01$, ***$p < .001$.