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Reports

Boys don't cry: Cognitive load and priming increase stereotypic sex differences in emotion memory☆

Leaf Van Boven a,⁎, Michael D. Robinson b

a Department of Psychology and Neuroscience, University of Colorado Boulder, USA
b Department of Psychology, North Dakota State University, USA

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The results of three experiments provide evidence that the relative accessibility of stereotypes about sex difference influences people's memory of very recent emotions. Being under high rather than low cognitive load caused females compared with males to recall experiencing more intense emotional reactions to saddening stimuli (Experiments 1 and 2), and relatively less intense reactions to angering stimuli (Experiment 2). Being directly primed with stereotypes about sex differences and being under high cognitive load both caused females to recall more intense reactions to saddening stimuli compared with females who were neither primed with stereotypes nor under cognitive load (Experiment 3). These results imply that the relative accessibility of stereotypes influences memories of emotion in a manner similar to stereotypes' influence on social perception. Implications of these findings for theories of emotion memory and for self-perpetuating stereotypes about emotional sex differences are discussed.

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Introduction

Most American bookstores stock a plurality of titles on sex differences. One popular series explains (figuratively) that men are from Mars, women from Venus (Gray, 2002b), and that understanding these differences can demystify and provide behavioral guidelines on a date (Gray, 2003b), in the bedroom (Gray, 2003a), while raising children (Gray, 2000) and, after things fall apart, when starting over following a breakup (Gray, 2002a). Among other things, such popular books reflect and reinforce popular stereotypes that women are more emotional than men, particularly regarding sadness (Birnbaum, Nosanchuk, & Cross, 1980; Brody, 1997; Johnson & Shulman, 1988; Robinson, Johnson, & Shields, 1998). Scientific evidence, in contrast, makes quite clear that the sexes are more similar than different in emotional experience, suggesting that stereotypes generally overstate emotional sex differences (Barrett, Robin, Pietromonaco & Eyssele, 1998; Hyde, 2006; LaFrance & Banaji, 1992; Shields, 1991, 1995).

The contrast between popular stereotypes about emotional sex differences versus scientific demonstrations of those sex differences naturally raises the question: Why don't people's personal emotional experiences dissuade beliefs in stereotypic sex differences? If women and men don't experience emotions of different intensity, why do they believe that they do? We think that one reason is that stereotypes can influence people's memory of their own emotions, which consequently reinforce stereotypic sex differences. We hypothesize, specifically, that stereotypes influence memory of emotion such that people recall their own emotions more stereotypically when the relative accessibility of those stereotypes is high. Procedures that increase stereotypes' relative accessibility, such as cognitive load and priming, should therefore increase stereotypic sex differences in emotion memory.

Consistent with these ideas, previous research demonstrates that people exhibit increasingly stereotypic emotion memories over longer periods of time (Robinson & Clore, 2002a). Asian Americans, for example, recall distant emotions as less intense and less positive than do European Americans (Oishi, 2002), consistent with stereotypic cultural differences, despite minimal cultural differences in immediate emotion (Diener, Napa Scolon, Oishi, Dzokoto, & Suh, 2000; Oishi, 2002). And women recall more intense emotions than men do over longer periods of time, consistent with stereotypic sex differences, despite minimal sex differences in immediate emotion (Barefoot & Straub, 1971; LaFrance & Banaji, 1992; Manstead, 1992; Seidlit & Diener, 1998; Shields, 1991).

One explanation of these temporal patterns in stereotypic emotion memory is that the relative accessibility of stereotypes increases over time, and the relative accessibility of stereotypes influence emotion memory. The relative accessibility of different types of information is obviously an interactive function of how easily that particular information can be retrieved compared with how easily other types of information can be retrieved. Over time, non-stereotypic information regarding the episodic details of emotional experience—
that is, information about the specific moments and details of an emotional episode—decays from memory and is less easily retrieved, often becoming functionally inaccessible (McClelland, McNaughton, & O'Reilly, 1995; Smith & DeCoster, 2000; Tulving, 2002; Tulving & Pearlstone, 1966; Wheeler, Stuss, & Tulving, 1997). In contrast, the ease with which stereotypic information can be retrieved does not decrease over time (Levine, 1997; Levine & Pizarro, 2004; Levine & Safer, 2002; Robinson & Clore, 2002a). People's intuitions about emotional events such as menstruation (McFarland, Ross, & DeCoville, 1989), for example, can influence reconstructive memories of emotions when episodic details have decayed from memory (Ross, 1989). The relative accessibility of stereotypes about emotion should consequently increase over time, thereby increasing stereotypic emotion memory.

The passage of time is a complicated variable, however. It is possible that the emergence of stereotypic memories over days and weeks is attributable to other, uncontrolled, confounding factors. These include, among others, hedonic adaptation (Wilson, Gilbert, & Centerbar, 2002), changes over time in appraisal (Levine et al., 2001), and the acquisition of new information.

We sought more direct evidence for the influence of stereotypes' relative accessibility on emotion memory. Our analysis was grounded in research on stereotypic person perception, which has well-developed models and procedures to examine the relative accessibility of stereotypes (Fiske & Neuberg, 1990; Higgins, 1996; Higgins & Brendl, 1995; Kunda & Thagard, 1996; Read & Miller, 1998; Smith, 1996; Trope & Gaunt, 2000). Stereotypes have been shown to be chronically accessible, automatically activated, and easily retrieved (Blair & Banaji, 1996; Bodenhausen, 1990; Devine, 1989; Lepore & Brown, 1997; Macrae, Bodenhausen, & Milne, 1995; Macrae, Milne, & Bodenhausen, 1994). Constraining cognitive resources by placing people under cognitive load thus increases stereotypes' relative accessibility by decreasing the accessibility of episodic detailed information, thereby increasing stereotypic social perception (Bodenhausen, 1990; Fiske & Neuberg, 1990; Gilbert & Hixon, 1991; Trope & Gaunt, 2000). People under high rather than low cognitive load, for example, are more likely to recall stereotype consistent information (Macrae, Hewstone, & Griffiths, 1993). Stereotypes can also be directly primed, increasing stereotypic social perception, as when people who have been primed with negative category labels render more negative stereotypic ratings (Lepore & Brown, 1997).

Drawing an analogy from the operation of stereotypes in person perception to the operation of stereotypes in emotion memory, we hypothesized that cognitive load and priming would increase stereotypic emotion memory even for very recently experienced emotions. The demonstration that cognitive load and priming increase stereotypic emotion memory for very recent emotion would offer at least three novel contributions. First, and most broadly, such findings would offer additional evidence that (re)constructive processes of emotion memory are similar to constructive processes of social perception. Second, the emergence of stereotypic emotion memory of very recent emotion would avoid concerns about uncontrolled confounds in time's passage. Finally, previous research has implied that stereotypes do not influence emotion memories unless episodic information has decayed from memory and is no longer accessible (Levine et al., 2001). The demonstration that cognitive load and priming increase stereotypic emotion memory even for recent emotions would therefore provide important evidence that emotion memory is shaped by stereotypes' relative accessibility, even when episodic emotional information has not decayed from memory.

We tested our predictions by inducing negative emotions using films (Experiments 1 and 3) and vignettes (Experiment 2). Following a delay of approximately 20 min—sufficiently short that episodic information would not have completely decayed from memory, yet sufficiently long that participants would no longer be emotionally aroused—people recalled the intensity of their negative emotional reactions, either while under high or low cognitive load. Being under high cognitive load increases stereotypes' relative accessibility by impeding the retrieval of episodic emotion memories. We predicted that being under relatively high cognitive load would cause women, compared with men, to recall feeling relatively more intense reactions to saddening stimuli (Experiments 1–3), but that this pattern would be diminished, if not reversed, for angering stimuli (Experiment 2). Importantly, we manipulated cognitive load during retrieval, not during encoding, to avoid influencing actual emotional experience. Finally, we tested whether directly priming stereotypes would influence emotion memories in a manner similar to cognitive load (Experiment 3).

**Experiment 1: Stereotypic sadness**

We first examined whether cognitive load would cause women, compared with men, to recall relatively more intense emotional reactions to sad films.

**Method**

Forty-six undergraduate students at the University of Colorado Boulder (31 females) participated in individual sessions in exchange for course credit. Participants were first asked to spend 2 min relaxing and “clearing your head of all thoughts and feelings” to place themselves in an emotionally neutral state. Participants then viewed one of two films, about which they would later answer some (unspecified) questions.

One film was a 330 second segment from the film Sophie's Choice in which Sophie, portrayed by Meryl Streep, is a Polish mother who has just arrived at Auschwitz where a SS officer forces her to select either her young daughter or young son to be sent to death in the gas chamber. The other film was a 345 second segment from the film Wit in which Vivian, portrayed by Emma Thompson, is dying from cancer and an elderly mentor visits her in the hospital, sits at her bedside, and reads aloud the children's book The Runaway Bunny. Both films centered on the core-relational theme of sadness at the irrevocable loss of a loved one (Lazarus, 1991); Wit has been shown in previous research to arouse sadness and distress (Gross & Levenson, 1995; Rottenberg, Ray & Gross, 2007).

After viewing the film, participants completed nonemotional activities for 20 min, such as anagrams, simple math problems, and unrelated questionnaires. These activities prevented rumination about the film. We assumed the 20 minute delay was sufficiently long that participants would no longer be emotionally aroused, but sufficiently short that episodic information would not have decayed from memory (Levine et al., 2001).

We then introduced the cognitive load manipulation. Explaining that the study concerned “multitasking,” all participants were given for memorization a 5-letter non-word string of consonants. Participants were randomly assigned to the high cognitive load condition, or to the low cognitive load condition, with the experimenter blind to condition. In the high cognitive load condition, the 5-letter string was complex (e.g., GTPWL). In the low cognitive load condition, the 5-letter string was simple (e.g., BBBBB) and therefore less cognitively demanding. Each participant in the high cognitive load condition received a unique letter string, and each participant in the low cognitive load condition received one of 20 randomly selected strings. Participants were told they would later be given a memory test for the letter string.

Immediately after beginning the memorization task, participants were asked to recall the overall intensity of their emotional reactions to the film (1 = not at all intense, 8 = extremely intense) and how much, during the film, they felt fearful, sad, and upset (1 = not at all, ...
Sex stereotype pilot test

To measure people's stereotypes about sex differences in emotion-based reactions to the film, we asked a separate group of 71 undergraduate students at the University of Colorado Boulder (25 females) to read a summary of Experiment 1's procedures, including detailed summaries of one of the films, randomly selected. These participants then estimated how much female and male participants who viewed the films would feel sad, fearful, and upset (1 = not at all, 8 = a great deal), with the three ratings averaged into an index of negative emotion (α = .72). Replicating previous research on stereotypic emotions, participants expected females to experience more intense emotional reactions (M = 6.07) than males (M = 4.48), as measured by the main effect in a 2 (participant sex: female, male) × 2 (target sex: female, male) ANCOVA, controlling for film, F(1, 67) = 54.23, p < .001.

Results and discussion

Recalled emotional reactions to the two films were not significantly different, nor did film interact with participant sex, cognitive load, or the interaction between participant sex and cognitive load, all Fs < 1.01, ns. We therefore included film as a covariate rather than a factor in our analyses.

As predicted, under high cognitive load females recalled more intense emotion than did males, but there was no sex difference under low cognitive load, yielding a significant interaction in a 2 (participant sex: female, male) × 2 (cognitive load: low, high) ANCOVA, controlling for film, F(1, 41) = 5.05, p = .03 (see Fig. 1). Under high cognitive load, females recalled more intense negative emotion (M = 5.95) than did males (M = 3.75), F(1, 20) = 10.21, p = .004, consistent with stereotypic sex differences. Under low cognitive load, females (M = 4.68) and males (M = 4.78) did not recall significantly different emotions, F(1, ns). These results indicate that cognitive load increases stereotypic emotion memory, even for very recently experienced emotions. This pattern is consistent with the hypothesis that stereotypes' relative accessibility influences emotion memory even for recent emotion. Being under high rather than low cognitive load, which has been shown to increase stereotype accessibility, caused people to remember recently experienced emotions more stereotypically.

Experiment 2: Stereotypic sadness and anger

We next sought a more precise test of the prediction that cognitive load increases stereotypic emotion memory. We also sought a test of our ideas — that would rule out the possibility that females, for reasons unrelated to stereotypes, are biased toward reporting more negative emotion, and that cognitive load exacerbates this bias. We did so by examining recalled emotional reactions to both sadness and anger. Unlike sadness, which females are stereotypically believed to experience more intensely than males, two prominent stereotypes are relevant for anger. One implies that women generally experience emotions more intensely than men; the other implies that women experience anger less intensely than men (Robinson & Clore, 2002a). Together, these two stereotypes imply that the belief that women experience more intense emotions than men is reduced, if not reversed, for anger compared with sadness (Birnbaum et al., 1980; Brody, 1997; Johnson & Shulman, 1988; Robinson et al., 1998). If cognitive load increases stereotypic emotion memory, then under cognitive load, women compared with men should recall experiencing relatively more intense reactions to saddening than to angering stimuli. This interaction between participant sex and emotion type (sadness versus anger) should be greater under high cognitive load than under low cognitive load.

We also tested whether the stereotypic emotion memories of participants under high cognitive load distort the magnitude of sex differences in immediately reported emotions. Implicit in our analysis is the assumption that being under high cognitive load causes people to exaggerate sex differences compared with people's immediate emotions. But it is possible, if unlikely, that people really do exhibit sex differences in emotional experience, and that people recall these sex differences more accurately when under relatively high cognitive load. It could be that, under low cognitive load, people engage in effortful introspection that impairs their ability to accurately recall emotional intensity, much as effortful introspection can sometimes undermine decision quality (Dijksterhuis, 2004; Wilson & Schooler, 1991). To examine this possibility, some participants reported their emotional reactions immediately after reading the vignettes. We did not manipulate cognitive load among these participants because cognitive load might influence immediate emotional experience (Ochsner & Gross, 2005).

Method

One hundred and sixty undergraduate students at the University of Colorado Boulder (94 females) participated in exchange for course credit. As in Experiment 1, participants were instructed to "clear your head" before emotion induction to place them in an emotionally neutral state. Participants were told that the experiment concerned the relationship between imagination and emotion, particularly regarding reactions to emotional vignettes. The use of vignettes to induce emotion is a common, well-validated technique that can be precisely crafted to reflect core relational themes (e.g., Gerrads-Hesse, Spies, & Hesse, 1994). While reading the vignette, participants were to try to "imagine you are experiencing the event."

Depending on random assignment to condition, participants were asked to read either angering or saddening vignettes. The angering vignette described betrayal of trust; the saddening vignette described a tragic situation. The vignettes were written by two University of Colorado Boulder undergraduates who were blind to hypotheses, and were asked to describe a situation centering on the themes of anger (unjustified infringement of one's rights) and sadness (important personal loss, Lazarus, 1991). The angry vignette described a situation in which a presumptuous roommate borrowed the protagonist's car without asking, crashed it, and then adopted a cavalier, remorseless attitude about the damage. The sad vignette described a protagonist relaying a story about a young cousin's tragic death following an accident on a go-cart track in which the young boy's chest was crushed by the go-cart's steering wheel.

Directly after reading the vignette, participants in the immediately reported emotion condition indicated how much (1 = very slightly/not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = very much)
they felt depressed, fearful, regretful, upset, stressed, and tense when reading the vignette. Participants in the other two conditions were asked to complete unemotional tasks, as in Experiment 1, for 20 min. Participants were then exposed to the cognitive load manipulation, as in Experiment 1. While rehearsing the letter string, which was either simple (in the low cognitive load condition) or complex (in the high cognitive load condition), participants were asked to recall how much, while reading the vignette, they felt the same six emotions as participants in the immediately reported emotion condition. Participants were then thanked and debriefed.

Results and discussion

Across the three experimentally manipulated conditions—immediately reported emotion, remembered emotion under low cognitive load, and remembered emotion under high cognitive load—the six ratings of negative emotion were positively correlated and averaged into an index of negative emotion ($\alpha = .82$). Because we did not use a fully factorial design we tested our predictions with focused contrasts (all dfs = 148), rather than an ANOVA, using the overall error term within a general linear model.

We first tested the overall pattern of hypothesized results: Participants in the high cognitive load condition would recall their emotions more stereotypically—for sadness women would recall relatively more intense emotions than men, and this sex difference would be reduced or reversed for anger—compared with participants in the low cognitive load and immediately reported emotion conditions. Specifically, we predicted that the participant sex $\times$ target emotion interaction would be significantly larger in the high cognitive load condition compared with the other two conditions. This contrast was significant, $t = 2.33$, $p = .021$ (Fig. 2). Among participants in the high cognitive load condition, the participant sex $\times$ target emotion interaction was significant, $t = 2.35$, $p = .020$. Whereas females recalled experiencing more intense emotional reactions to the sad vignette ($M = 2.38$) than did males ($M = 1.42$), $t = 2.25$, $p = .026$, females recalled experiencing less intense reactions to the angry vignette ($M = 1.57$) than did males ($M = 2.00$), although the difference was not significant, $t = 1.05$, ns. Under high cognitive load, then, participants exhibited stereotypic sex differences in emotion memory.

Among participants in the low cognitive load and immediately reported emotion conditions, the participant sex $\times$ target emotion interaction did not approach significance, $t < 1$. Nor did the 2-way interaction differ between participants in the low cognitive load and immediately reported emotion conditions, $t < 1$. When reporting immediate emotions and when recalling emotions while under low cognitive load, participants did not exhibit stereotypic sex differences.

Taken together, these results provide more precise evidence that cognitive load increases stereotypic sex differences in memories of recently experienced emotion, and that the nature of these stereotypes is moderated for anger compared with sadness. These results thus cast doubt on the possibility that women are simply biased to report more negative emotion than men, and that cognitive load exacerbates this bias. Although women are stereotypically believed to experience emotions more intensely than men, this sex difference is weaker for anger. Being under high cognitive load therefore caused females to recall more intense emotional reactions than did males to sad stimuli, but this difference was significantly reduced, even somewhat reversed, for angering stimuli.

These results also indicate that the sex differences in recalled emotional intensity under high cognitive load are different from the (lack of) sex differences in recalled emotional intensity under low cognitive load and when reporting immediately experienced emotion. By the criterion of immediately reported emotional reactions, being under high cognitive load thus distorts memory for emotion compared with being under low cognitive load.

Experiment 3: Primed stereotypes

Our idea is that the relative accessibility of stereotypes about sex differences influences memory for recently experienced emotions. This analysis implies that different procedures of increasing the accessibility of stereotypes about sex differences should similarly increase stereotypic emotion memory. We examined this possibility in Experiment 3 by testing whether directly priming stereotypes about sex differences would increase stereotypic emotion memory in a manner similar to cognitive load.

We crossed the manipulation of cognitive load from Experiments 1 and 2 with a stereotype priming manipulation. Both cognitive load and priming should increase stereotype accessibility, albeit for different reasons, and should therefore increase stereotypic emotion memory. We predicted, specifically, that among participants under low cognitive load, those primed with sex differences would recall more stereotypic emotion compared with those primed with a neutral stereotype, even though participants’ cognitive resources would not be constrained which would allow them to retrieve episodic emotional information. We also predicted that among participants exposed to a neutral prime, those under high cognitive load would recall more stereotypic emotion compared with those under low cognitive load, conceptually replicating the results of Experiments 1 and 2.

Finally, we predicted that the combined effects of cognitive load and priming would be redundant such that the combination of these two procedures would not produce more stereotypic emotion memory than either procedure in isolation. There are at least two reasons for this. The first is that multiple experimental procedures might have diminishing effects on stereotype accessibility. Consequently, the combination of two otherwise equally potent procedures (cognitive load and priming) might not double stereotype accessibility, and hence would not double stereotypic emotion memory. The second reason is that increases in stereotype accessibility might have diminishing effects on emotion memory. Consequently, a doubling of stereotype accessibility through the combination of two equally potent procedures (cognitive load and priming) might not double stereotypic emotion memory. Importantly, both reasons—that multiple procedures have diminishing effects on accessibility, and that accessibility has a diminishing effect on stereotypic emotion memory—assume that cognitive load and priming have similar effects on stereotype accessibility. This analysis thus implies an interaction between priming and cognitive load, that cognitive load would have no effect among female participants who were primed with stereotypic sex differences, and that being primed with sex differences would have no effect among participants under high cognitive load.

Fig. 2. Experiment 2: Recalled intensity of emotional reactions to saddening or angering vignettes by female and male participants, reported directly afterward (Immediate Report), after a 20 minute delay while under low cognitive load (Low Cognitive Load), or reported after 20 minute delay while under high cognitive load (High Cognitive Load).
Method

Sixty-two female undergraduate students at the University of Colorado Boulder participated in exchange for course credit. Only female participants were included for convenience and to avoid stereotype primes, described below, with systematically different content. After the “clear your head” instructions used previously, participants were shown the sad film clip from Wit, described in Experiment 1. Participants then completed unemotional activities for 20 min.

The priming manipulation was presented in the final page in a packet of ostensibly unrelated questionnaires. Participants were asked to “list some ways that you are different from a specific group of people in terms of behaviors, emotions, values, and/or lifestyle.” Participants randomly assigned to the neutral stereotype prime condition were asked to list up to five differences between themselves and the typical Canadian, which we did not expect to increase the accessibility of stereotypes about sex differences. Participants assigned to the sex differences prime condition were asked to list up to five differences between themselves and the typical “member of the opposite sex” (Robinson & Clore, 2002b).

Following the priming manipulation, participants received either the low or high cognitive load manipulation, exactly as in Experiments 1 and 2. While memorizing the simple letter strings, participants recalled the overall intensity of their emotions (1 = not at all, 7 = extremely intense) and how much (1 = not at all, 7 = very much) they felt fearful, sad, and upset during the film. We averaged these four ratings into an index of recalled negative emotion (α = .80). Participants were then thanked and debriefed.

Results and discussion

Our primary predictions were supported (see Fig. 3). Among those in the low cognitive load condition, female participants exposed to the sex difference stereotype prime recalled more intense emotion (M = 5.02) than participants exposed to the neutral prime (M = 4.15), t(28) = 2.07, p = .043. Among those in the neutral prime condition, female participants recalled more intense emotion under high cognitive load (M = 5.15) rather than low (M = 4.15) cognitive load, t(58) = 2.08, p = .042, conceptually replicating Experiments 1 and 2. Priming and cognitive load thus both increased stereotypic emotion memories by comparison to participants who were neither under cognitive load nor primed with sex differences.

Also as predicted, a 2 (prime: sex differences, neutral) × 2 (cognitive load: low, high) ANOVA yielded a significant interaction, F(1, 58) = 4.05, p = .049. Neither main effect approached significance, both Fs < 1.11, ns. In the sex difference prime condition, there was no effect of cognitive load, and in the high cognitive load condition there was no effect of prime, both ts < 1, ns. Cognitive load and priming thus had redundant effects on stereotypic emotion memory.

These results together demonstrate that multiple means of increasing stereotype accessibility—cognitive load and priming—both increase stereotypic emotion memory. These results thus provide triangulated evidence that the relative accessibility of stereotypes about emotion increases stereotypic emotion memory for recently experienced emotions—and even for those in the low cognitive load condition, when people were presumably capable of retrieving non-stereotypic episodic emotional information.

General discussion

Emotion memories are important. Clinically, counselors ask clients to remember feelings of depression and anxiety to diagnose clinical conditions (e.g., Beck, 1972; Borkovec, Alcaine, & Behar, 2004). Personally, emotion memories guide people’s expectations and decisions (e.g., Loewenstein & Schkade, 1999; Mellers, Schwartz, Ho, & Ritov, 1997; Wilson & Gilbert, 2003). Scientifically, researchers ask people to recall emotions to construct theories of personality and emotion (e.g., Clark & Watson, 1999; Diener, 1994; Diener, Emmons, Larsen, & Griffin, 1985; Larsen, Diener, & Emmons, 1986; Watson, 2000). Understanding how, and how well, people recall their emotions is thus of central scientific importance.

The present results reiterate that emotion memory is constructive (Levine, 1997; Levine & Pizarro, 2004), and demonstrate that stereotype accessibility influences memory even for recently experienced emotion. Being under high rather than low cognitive load caused females, compared with males, to recall experiencing relatively more intense reactions to saddening stimuli (Experiments 1 and 2) and relatively less intense reactions to angering stimuli (Experiment 2). Being directly primed with stereotypes about sex differences and being under cognitive load both caused females to recall more intense, stereotypic emotional reactions compared with when they were neither primed nor under cognitive load (Experiment 3).

The present experiments significantly extend previous research that has implicated the emergence of stereotypic emotion memories over time. Even following short delays in which episodic information presumably has not decayed from memory, being under high cognitive load, which increases the relative accessibility of stereotypes, increases stereotypic emotion memory. Further, directly increasing stereotypes’ relative accessibility through priming produces more stereotypic emotion memory even when people are not under cognitive load, and presumably had the cognitive resources available to retrieve episodic emotional information.

One question that often arises in examining experimentally manipulated emotions is whether the results might be due to some stimulus-bound factor other than the target emotion. Of course, all psychological phenomena are somewhat stimulus-bound. There are, however, at least two reasons we believe that the stereotypic influences demonstrated here are more general than the specific stimuli we used. First, we replicated our key findings with two kinds of emotion, sadness and anger, and with two kinds of emotionally evocative stimuli, films and vignettes. Second, any factor other than the core emotional themes of sadness and anger would need not only to explain the emergence of sex differences, but would also have to explain the absence of sex differences when participants are under low cognitive load or participants report their emotions directly after exposure to the emotionally evocative stimuli. We believe the core emotions of sadness and anger, and people’s stereotypes about those emotions, provide the most coherent explanation of these findings.

Still, an important question for future research is whether these findings might be replicated with different stereotypes and different emotions. Our theoretical analysis implies that other stereotypic sex differences, such as the belief that men experience pride more intensely than women (Robinson et al., 1998), might be particularly

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Fig. 3. Experiment 3: Female participants’ recalled intensity of negative emotional reactions to a sad film while under low or high cognitive load, after being primed with either neutral stereotypes (of Canadians) or with stereotypes about sex differences.
likely to emerge when people recall their emotions under cognitive load. Our theoretical analysis also applies to cultural stereotypes, such as the commonly held beliefs that East Asians experience less intense positive affect than Westerners, or that British are stoic when under cognitive load. And there may be many circumstances in everyday life when people are under cognitive load: the stresses of keeping busy daily schedules, multitasking, and generally being distracted from focused recollection of emotional experience. People’s personal memories—the very source of information that might disconfirm stereotypes—may therefore perpetuate stereotypes. Stereotype sex differences in emotion not only make people perceive the opposite sexes as caricatures, these stereotypes also make people caricatures to themselves.

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