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Emotion, gender, and gender typical identity in autobiographical memory

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ABSTRACT

Gender differences in the emotional intensity and content of autobiographical memory (AM) are inconsistent across studies, and may be influenced as much by gender identity as by categorical gender. To explore this question, data were collected from 196 participants (age 18–40), split evenly between men and women. Participants narrated four memories, a neutral event, high point event, low point event, and self-defining memory, completed ratings of emotional intensity for each event, and completed four measures of gender typical identity. For self-reported emotional intensity, gender differences in AM were mediated by identification with stereotypical feminine gender norms. For narrative use of affect terms, both gender and gender typical identity predicted affective expression. The results confirm contextual models of gender identity (e.g., Diamond, 2012). The desire disorder in research on sexual orientation in women: Contributions of dynamical systems theory. *Archives of Sexual Behavior*, 41, 73–83) and underscore the dynamic interplay between gender and gender identity in the emotional expression of autobiographical memories.

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Autobiographical memory (AM) is integrally related to both identity and health; how we remember our personal past both influences and is influenced by our current sense of self (Conway & Pleydell-Pearce, 2000; McAdams, 2001). Further, more emotionally expressive and socially connected autobiographical narratives are related to higher levels of both psychological and physical health outcomes (see Fivush, 2010, for a review; and Frattaroli, 2006, for a meta-analysis). Thus, individual differences in elaborated emotional expression in AM is an important topic, and gender has emerged as a critical factor. Although not all AM studies find gender differences, when gender differences emerge they follow a clear pattern, especially with regard to emotional expressivity. Females narrate more emotionally expressive memories than males, but, intriguingly, gender differences on ratings scales of emotionality of autobiographical memories are less consistent (e.g., Escobedo & Adolphs, 2010; Neumann & Phillipot, 2007; see Grysman & Hudson, 2013). The pattern of gender differences raises important theoretical and methodological questions, which we address in this study. Theoretically, are gender differences more apparent for some individuals than others? In particular, if AM and identity are linked, how might gender differences in AM be related to differences in gender identity, especially given that emotionality is one of the most strongly held stereotypes about gender (Fischer, 2000)?

Gender identity is a complex construct, encompassing both implicit embodied aspects of identity as expressed in language and narrative (Fivush & Zaman, 2014; Pennebaker, Mehl, & Niederhoffer, 2003; Stapleton, 2000; Tannen, 2000),

and explicit knowledge of and adherence to gender stereotyped social roles, attitudes and behaviours, and traits (Owen-Blakemore, Berenbaum, & Liben, 2009; Tobin et al., 2010). This distinction is important because most studies of AM use explicit self-report of memory phenomenology, which we argue is related to more explicit aspects of gender identity, with fewer studies examining actual autobiographical narratives in which gender is more implicitly expressed. Thus, in this study, we systematically examine if and how method influences relations between gender, gender identity and reported emotion in AM. Based on socio-cultural theory (Nelson & Fivush, 2004), we posit that gendered narratives are socialised early in development and remain implicit in the expression of gender throughout development, thus leading to overall gender differences in emotional aspects of narrative recall. In contrast, more explicit aspects of gender typical identity develop more gradually, are dynamic across the life span (Deaux & Major, 1987; Diamond, 2012; Martin & Ruble, 2010), and will be related to more explicit aspects of AM, namely self-reports of the emotional quality of memory. Thus individuals who define themselves in gender typical terms will self-report more emotional and affective AM, but it is not clear whether gender typical identity will play a role in the more implicit expression of gender identity in narrative recall.

In the sociocultural developmental theory of AM, Nelson and Fivush (2004) contend that children learn both how and what to recall through parent-structured reminiscing. Substantial correlational, longitudinal, and experimental research has confirmed that parents who

narratively reminisce in more coherent and emotionally expressive ways have children who develop more detailed, coherent, and emotionally expressive autobiographical narratives (see Fivush, 2014, for a review). Importantly, reminiscing style is related to gender. Consistent patterns with European-American samples indicate that both mothers and fathers are more emotionally elaborative and relationally oriented when reminiscing with daughters than with sons (Zaman & Fivush, 2013). Although early in parent-child reminiscing there are no differences between daughters' and sons' memory reports, by age four through adulthood, females tell more emotionally elaborative and relationally oriented autobiographical narratives than males (see Gryzman & Hudson, 2013, for a review). This pattern suggests that parent-guided reminiscing may facilitate the socialisation of a gendered narrative style that follows cultural stereotypes about gender that emphasise the expression of emotion and relationships for girls more than for boys (Brody, 1999; Root & Denham, 2010). Thus early socialisation of a "gendered narrative style" may facilitate increased expression of emotion in narrating the experiences of one's life more so for females than males, and this may remain implicit in narrative language across development. As Pennebaker et al. (2003) have argued, word choice occurs at an implicit level and provides information about one's orientation to the world in terms of power, social relationships, and self. From this perspective, language and identity are intertwined in that how we express our selves creates our gendered identity through the constructed narrative (Fivush & Zaman, 2014; Stapleton, 2000). Thus early socialisation experiences may lead females overall to express emotion as more central to self in their autobiographical narratives.

Yet research with adults has demonstrated inconsistent gender effects. Gryzman and Hudson (2013) suggest that we must also consider individual differences in more explicit gender identity. Individuals differ in the extent to which they explicitly subscribe to cultural stereotypes of gendered identity (Martin & Ruble, 2010; Tobin et al., 2010), and this should be related to the expression of autobiographical memories in ways that produce predictable individual differences. Thus, in addition to gendered narrative socialisation, there may also be effects of individual differences in explicit adoption of gender typical identity on the extent of emotional expression in AM, with individuals subscribing to a more female typical identity expressing more affect in their autobiographical narratives.

Thus, in order to examine relations among gender, gender identity and emotional aspects of AM, we must consider how AM is quantified. Gender differences in AM emerge more consistently in studies that use narrative content as a dependent variable than in those that employ self-report measures (Gryzman & Hudson, 2013). Since most studies employ either narrative methods or self-report methods but not both, it is important to compare the two in the same study to achieve clarity on

this matter. In a review of the narrative identity literature, Adler, Lodi-Smith, Philippe, and Houle (2015) demonstrate that narrative and self-report measures provide unique variance in predicting well-being. Similar to arguments above about language, several theorists have argued that narratives capture something more implicit, or less reflective, about identity (Pillemer, 2009) or motivations (McClelland, Koestner, & Weinberger, 1989; Woike, 2008), whereas self-report relies on an explicit, self-reflective process (Waters, Bauer, & Fivush, 2014). Because implicit motives affect how events are encoded and recalled, narrative measures are better suited to capture implicit factors than self-report, which better assess explicit factors (Adler et al., 2015). Thus, early narrative socialisation may lead to deeply embedded implicit gendered language use in narratives (Shields & Diccio, 2011; Stapleton, 2000), whereas self-report measures may rely more on explicit reflective adherence to gender typical identity.

Objectives

This study aims to examine the extent to which gender and feminine gender typicality predict gender differences in emotional aspects of autobiographical recall. To resolve discrepancies in the extant literature on gender differences in AM, we examined both emotional intensity of recall using self-report measures and content of recall using narrative expression of emotion. We measured explicit gender identity in a multitude of ways. First, we used the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1974) because it contains trait terms intended to capture both stereotypic feminine gender norms relevant to interpersonal and expressive behaviours and masculine gender norms relevant to independence and agency. Then, we used two self-report measures of gender identity specifically focused on emotionality. Emotionality is a critical component of gender identity because one of the most pervasive stereotypes about gender is that women are more emotional than are men (see Fischer, 2000, for a review). We assessed self-reported emotional sensitivity (Bloise & Johnson, 2007; Riggio, 1986) and emotional restrictiveness (Snell, 1989), constructs that are theoretically related to gendered stereotypes about emotion, with women stereotypically displaying more emotional sensitivity and men stereotypically displaying more emotional restrictiveness. In terms of gender differences in AM, we predicted that women would report more emotionally intense AM than men, and would narrate more emotionally saturated memories than men. We further predicted that these relations would be mediated by gender typical identity, but that this might differ by method. For more explicit self-report measures, we predicted that gender typical identity would mediate the relation between gender and AM. For more implicit narratives, we predicted gender differences in expression of affect, but we were not sure if this would be mediated by gender typical identity.

Method

Participants

Participants were recruited via the Internet using Amazon's Mechanical Turk. Data were collected from 196 participants (98 women, 98 men), age 18–40. Mean reported age was 29.05 (SD = 6.25) for women and 29.04 (SD = 6.01) for men. Data from three additional participants were not included in the analyses because these participants self-identified as “transgender”. Reported ethnicity for men was 67 Caucasian, 6 African-American, 12 Asian American, 9 Latino or Hispanic, 2 Native American, and 2 Biracial; for women, 75 Caucasian, 6 African-American, 6 Asian American, 5 Latino or Hispanic, 1 Middle Eastern, 4 Biracial, and 1 “other”. Reported highest level of education among men included 12 participants with a high school diploma, 36 with some college, 40 with a bachelor's or associate's degree, and 10 with an advanced degree (master's or Ph. D.); among women, reported highest level of education included 10 participants with a high school diploma, 27 with some college, 45 with a bachelor's or associate's degree, and 16 with an advanced degree (master's or Ph. D.). Finally, when asked about annual household income, among males, 44 participants reported earning \$20,000 or less; 22 reported earning \$20–40,000; 15 reported earning \$40–60,000; 7 reported earning \$60–80,000; and 10 reported earning \$80,000 or higher; among women, 44 participants reported earning \$20,000 or less; 25 reported earning \$20–40,000; 18 reported earning \$40–60,000; 4 reported earning \$60–80,000; and 7 reported earning \$80,000 or higher.

Materials

Four narrative prompts we included in this study. The *neutral event* prompt included the following instructions:

Pick an event that has happened in the past two years. The type of event we are looking for is NOT a general, day-to-day recurring activity, but a SPECIFIC EVENT that can be distinguished from the day-to-day recurring events.

Please describe this event as if you were telling it to a friend in a conversation. Your description should be at least two paragraphs in length.

The *high point* and *low point* event prompts were adapted from McAdams' Life Story Interview (McAdams, 1997). They included the following instructions:

Many people report occasional “peak experiences”. These are generally moments or episodes in a person's life in which he or she feels a sense of great uplifting, joy, excitement, contentment, or some other highly positive emotional experience. Indeed, these experiences vary widely. Some people report them to be associated with religious or mystical experience. Others find great joy or excitement in vigorous athletics, reading a good novel, artistic expression, or in love or friendship. A peak experience may be seen as a “high point” in your life story – a particular experience that stands out in your memory as something that is extremely positive. Please

describe below in some detail a peak experience that you have experienced sometime in your life.

A “nadir” is a low point. A nadir experience, therefore, is the opposite of a peak experience. Please think about your entire life. Try to remember a specific experience in which you felt extremely negative emotions, such as despair, disillusionment, terror, profound guilt, shame, etc. You should consider this experience to represent one of the “low points” in your life story. Even though this memory is unpleasant, we would still appreciate an attempt on your part to be honest and straightforward and to provide us with as much detail as possible.

Both prompts concluded with the following statement:

Make sure that this is a particular and specific incident (e.g., happened at a particular time and in a particular place) rather than a general “time” or “period” in your life. Please describe this event as if you were telling it to a friend in a conversation. Your description should be at least two paragraphs in length.

The final event prompt was for a *self-defining memory* (Singer & Salovey, 1993), and this term was defined for participants using Singer and Salovey's (1993) definition, and readers are directed there for the entire prompt.

In addition to the four narratives, participants also completed rating scales about each event and about gender identity.

Event-based ratings of emotional intensity

Participants completed a modified version of the Memory Experiences Questionnaire (MEQ, Sutin & Robins, 2007), as shortened by Gryzman, Prabhakar, Anglin, and Hudson (2013). This measure was chosen because it is a comprehensive self-report measure of AM quality that has been validated and used extensively throughout the AM literature, and it was shortened in order to be used repeatedly. Sutin and Robins (2007) divided the MEQ into ten factors: *vividness, coherence, accessibility, sensory detail, emotional intensity, visual perspective, time perspective, distancing, sharing, and valence*. For this analysis, only the emotional intensity subscale was of interest, and included three items: *my emotions are very intense concerning this event; I do not remember having particularly strong emotions at the time of this event; the memory of this event evokes powerful emotions*. A reliability analysis was performed using scores on this subscale for each narrative condition, and indicated acceptable to strong reliability, with Cronbach's α scores ranging from .73 to .82 across the four narrative conditions.

Gender identity measures

Personal Attributes Questionnaire Short Form (PAQ-F & PAQ-M). This scale, developed by Spence and Helmreich (1978), divides into three 8-item subscales, two of which were used in these analyses. The feminine subscale (PAQ-F) includes eight trait terms that are largely relevant to gender differences in AM, (*emotional, devotes self, gentle, helpful, kind, understanding, aware of feelings, and warm*). The subscale was designed to include trait terms that are socially desirable among both sexes but more common

among women, and broadly reflects interpersonal and expressive traits (Helmreich, Spence, & Wilhelm, 1981). The PAQ-F demonstrated good reliability, *Cronbach's* $\alpha = .79$. The PAQ masculine subscale (PAQ-M) includes eight trait terms (*competitive, active, independent, decisive, never gives up, self-confident, feels superior, and stands up under pressure*) that are socially desirable among both sexes but more common among men, including goal-oriented and instrumental traits (Helmreich et al., 1981) and also demonstrated good reliability, *Cronbach's* $\alpha = .78$. All scores are reported on a 1–9 scale, with higher scores indicating that the trait terms are more self-descriptive.

Emotional and Interpersonal Sensitivity Measure (EISM). Developed by Bloise and Johnson (2007), this measure includes eight items from the Social Skills Inventory (Riggio, 1986) and four additional items developed by Bloise and Johnson (2007), who found that this scale mediated gender differences in memory of emotion-related statements in passages read by participants. Example items include “I can always feel when there is tension in a room” and “I am generally influenced by the moods of those around me.” Reliability was acceptable, *Cronbach's* $\alpha = .62$, and because of the previous finding by Bloise and Johnson (2007), it was included in analyses. All scores are reported on a 1–5 scale, with higher scores representing more emotional and interpersonal sensitivity.

Restrictive Emotionality and Inhibited Affection (RES-IAS). These two subscales of the Masculine Behavior Scale (MBS; Snell, 1989), each composed of five items, were included. When examining all 10 items together, reliability was strong, *Cronbach's* $\alpha = .92$, and so the two subscales were combined for analyses to reduce redundancy and multiple comparisons. Example items include, “I don't usually discuss my feelings and emotions with others,” and “I don't often tell others about my feelings of love and affection for them.” All scores are reported on a 1–5 scale, with higher scores representing more restricted emotionality and inhibited affect.

Procedure

Participants were offered \$.55 to complete a half-hour survey. They were also informed that they may be contacted with a follow-up survey of a similar length, for which they would be paid an additional \$1, for a total of \$1.55 for one hour of work, in line with rates commonly paid on Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011).

In the first session, participants entered demographic information, and then were presented with two memory narrative prompts, the *neutral event* followed by the *high point event*. After each narrative, participants indicated when the event happened and completed the shortened MEQ. After completing both narratives and the questionnaires that followed, participants were invited to provide an email address if they wanted to be contacted to complete a second survey of similar length. In the second

survey, participants reported two additional memories, the *low point event* followed by the *self-defining memory*. Participants completed the same MEQ items after these two memories as in the first step of the experiment.

After completing the report of the final two memory narratives in the second stage of data collection, participants completed the four questionnaires relevant to gender identity. Final demographic information was collected, and participants were thanked and paid via the Mechanical Turk web site.

The order of the four narrative prompts (neutral event, high point, low point, and turning point) was designed so that each narrative prompt was increasingly explicit in its emotionality and self-relevance. Though the low and high point can be considered equally explicit about emotion, the prompts were set up so as to not end the first data collection on a low point narrative.

The reason for two stages of data collection was that, based on the experience of the first author in previous online data collection, it has been found that Mechanical Turk workers are often not interested in completing hour-long surveys, resulting in partially completed work or in work that diminishes in quality throughout the course of the experiment. Thus, two stages were initiated, and foil items (e.g., “this is a test item—please click ‘strongly agree’”) were included in both phases so that only participants who correctly answered the foil items were invited for a second session, which was completed between one and seven days after the first survey. In the first phase, 342 participants completed the survey. Twenty-eight answered at least one foil item incorrectly, 16 did not provide 2 narratives, and 4 self-identified as “transgender”. Of those invited back, 69% (203/294) completed the second survey, and 7 of these participants (in addition to the 196 reported) were excluded from analyses for not answering foil items correctly on the second survey. Data collection was pre-planned to collect data from 200 participants, and after the rejections were made to arrive at 196, this was considered sufficient, and so data collection stopped.

Narrative content coding

Narratives were coded for affect use within the narrative using an instance-based coding scheme in which every emotional or affectively charged utterance was identified and totalled. Examples of affect include “I really *loved* him” as well as “*My heart sank*” and “I remember the *excitement* and *joy* that I felt.” These utterances were then sub-coded for whether they were positive or negative as well as who was feeling the emotion or affect (e.g., self or other). After each affect utterance was identified, coders tallied the number of instances to get a total for each narrative. For the purposes of the current study (to examine the sheer number of affective utterances) we collapsed across the different subcodes to calculate the totals. Two research assistants were trained and achieved reliability by coding 20% of the corpus of narratives, with Cohen's

$\kappa = .85$. Scores on affect use reported represent counts and not proportions of narrative length. In a preliminary repeated measures ANOVA across the four narrative condition, no difference in narrative word length were found between men and women, $F(1, 194) = 1.86, p = .17$. Because no consistent differences emerged in length, and because elaboration about affect is one way that narrative length increases, it was not deemed appropriate to correct for narrative length for the purpose of these analyses.

Results

A preliminary multivariate analysis of covariance was conducted for the two dependent measures (self-reported emotional intensity ratings and affect coding) with reported gender as a dichotomous between groups predictor, the four gender identity measures as covariates, and the four narrative conditions (neutral, high point, low point, and self-defining) as repeated measures. No main effect of narrative elicitation emerged; one interaction emerged but the follow-up test was non-significant. Thus, scores on both dependent measures were summed across the four narrative conditions for the purposes of analyses.

Descriptive statistics

Table 1 displays descriptive information about the four gender identity scales alongside emotional intensity ratings and affect in narrative content. As can be seen, women's and men's scores on all six measures differed significantly, providing broad support for the dichotomy of PAQ-F and EISM representing femininity and the PAQ-M and RES-IAS representing masculinity, although a substantial degree of variation exists beyond this conceptualisation. Additionally, correlations between these six measures are presented in Table 2. As a part of this analysis, correlations were computed for the entire sample, and again separately for men and for women. Using the Fisher r -to- z transformation, correlations for men and women were compared to assess if different patterns would emerge for the two groups. Only one correlation (affect use in narratives and RES-IAS scores) differed at a level below conventional $p = .05$ levels, but once a

Table 1. Means (standard deviations) for the four gender identity scales and for emotional intensity ratings and affect terms in narrative content.

	Male	Female	$t(194)$	d
PAQ-F	6.71 (1.04)	7.11 (.99)	-2.79**	.39
PAQ-M	6.49 (1.09)	5.81 (1.40)	3.82***	.54
RES-IAS	3.01 (.93)	2.68 (.86)	2.59**	.37
EISM	3.48 (.39)	3.76 (.46)	-4.66***	.66
Emotional Intensity	4.12 (.55)	4.28 (.49)	-2.17*	.31
Affect	12.32 (7.42)	15.02 (6.84)	-2.65**	.38

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2. Pearson's correlation between the six variables, including the four gender identity measures and the two dependent measures. (a) presents the overall correlations for the entire sample; (b) and (c) present correlations separately for men and women, respectively.

	PAQ-M	RES-IAS	EISM	Emotional intensity	Affect
(a)					
PAQ-F	.02	-.50**	.40**	.37**	.09
PAQ-M	—	-.02	-.20**	.09	-.18*
RES-IAS		—	-.26**	-.29**	-.05
EISM			—	.19**	.08
Emotional intensity				—	.09
(b)					
PAQ-F	.09	-.49**	.38**	.41**	.14
PAQ-M	—	-.07	-.12	.26**	-.16
RES-IAS		—	-.18	-.33**	-.19
EISM			—	.20*	.03
Emotional Intensity				—	.09
(c)					
PAQ-F	.06	-.47**	.35**	.28**	-.05
PAQ-M	—	-.07	-.13	.02	-.12
RES-IAS		—	-.26**	-.19	.19
EISM			—	.11	.01
Emotional Intensity				—	.02

* $p < .05$.

** $p < .01$.

Bonferroni correction for multiple comparisons was applied, this correlation was also rendered non-significant. Thus, any differences between Table 2(b) and 2(c) should be interpreted as minor, and correlations presented in Table 2(a) are interpreted as representing the entire sample.

Notably, self-reported emotional intensity and affect in narrative content are not correlated, suggesting these two constructs capture different aspects of gendered AM. This correlation matrix is also useful in understanding how to interpret the four gender identity scales. First, the emotional intensity scale correlates with three of the four gender measures (although there is some differentiation here between men and women, see Table 2(b) and 2(c)), whereas the PAQ-M measure correlates with only one. Second, there is no correlation between the PAQ-M, largely a measure of instrumentality, and the RES-IAS, a measure more specific to emotions, suggesting that neither of these scales should simply be considered a measure of "masculinity", and building on Spence, Helmreich, and Stapp's (1975) conceptualisation of the PAQ-M and PAQ-F as uncorrelated measures of masculinity and femininity. Still, because of the high overlap between some scales, all predictors were submitted to regression analyses in order to include partial correlations when considering these measures.

Main analyses

Two hypotheses were tested: first, it was predicted that women would self-report higher emotional intensity and would use more affect in their narratives than men. Second, it was predicted that gendered self-rated

Table 3. Hierarchical regression analyses of emotional narrative content and self-reported emotional intensity, with dichotomous gender and the four gender identity scores as predictors. Beta values represent standardised coefficients.

	Predictors	Y: Affect		Y: Emotional intensity ratings	
		β	T	β	t
Step 1	Gender	.187	2.65**	.154	2.17*
Step 1		$R^2 = .035^{**}$		$R^2 = .024^*$	
Step 2	Gender	.143	1.87 ^o	.096	1.33
	PAQ-F	.077	.89	.272	3.35***
	PAQ-M	-.147	-1.98*	.112	1.61
	RES-IAS	.009	.11	-.124	-1.61
	ESS	-.027	-.335	.038	.50
Step 2		$R^2 = .057^*$		$R^2 = .168, p < .001$	
ΔR^2		.022		.144	

* $p < .05$.

** $p < .01$.

*** $p = .001$.

^o $p < .10$.

emotionality would be mediated by gender identity, such that higher scores on subscription to feminine stereotypes would predict higher self-rated emotional intensity. However, it was predicted that this mediation, if present, would be weaker for narrative affect content. These predictions were tested using a hierarchical regression and Sobel's tests, as can be seen in Table 3.

As can be seen in Table 3, self-reported emotional intensity was predicted by gender, $\beta = .154, p = .031$, but that this relation was mediated by the inclusion of the PAQ-F in the model, as confirmed by a Sobel's test, $Z = 2.14, p = .032$. A similar mediation of gender was found with the EISM ($Z = 2.32, p = .020$) and with the RES-IAS ($Z = 2.20, p = .028$), but, as can be seen in Table 3, when all three of these scales are included in regression analyses, partial correlations render both of these predictors non-significant. The PAQ-M did not predict emotional intensity ratings in any step of analyses. In other words, women rated their memories as more emotionally intense than men, but relations between gender and emotional intensity were overshadowed by the positive correlation between ratings of stereotypic feminine traits and ratings of emotional intensity (see Table 3). Gender similarly predicted affect in narrative content, $\beta = .187, p = .009$. Inclusion of the gender identity measures did reduce the predictive nature of gender to $\beta = .143, p = .064$, with a relation found between the PAQ-M and emotional narrative content (see Table 3). The Sobel's test of this change did not achieve conventional significance levels, $Z = 1.76, p = .078$. To avoid relying solely on two tests, one slightly above and one slightly below the threshold of $p = .05$, a clearer understanding of these results emerges by examining the effect sizes in Table 3. As can be seen, the variance in affect scores explained by gender is not greatly improved when the gender identity scales are included, $\Delta R^2 = .022$ with four new predictors. Conversely, including these gender identity scales, particularly the PAQ-F, dramatically increases the variance on emotional intensity ratings explained, $\Delta R^2 = .144$.

In sum, different patterns emerged for self-reported emotional intensity and narrated affect across four emotional memories when considering gender and various gender identity measures as predictors. For self-reported emotional intensity, gender differences emerged but were mediated by gender typical identity using the PAQ-F (though also with the EISM and RES-IAS before partial correlations). Conversely, for the narrative measure of affect used, the predictive power of gender was less substantially reduced when including multiple predictors of gender identity.

Discussion

Gender differences in the emotional aspects of AM remain controversial. Although some AM studies do not find any gender differences, when differences emerge they indicate that women self-report more emotional AMs than men, and provide AM narratives that are more emotionally expressive than do males (Grysmán & Hudson, 2013). In support of Grysmán and Hudson's (2013) suggestion, the lack of consistency in the AM literature may be explained by widely varying methods, populations, and analyses of gender that do not include attention to gender identity.

In this study, we examined if and how explicit gender typical identity, assessed by multiple measures, mediates gender differences in AM. This is the first study in the literature to examine this question, and our results are provocative. Using a large, internet-based, developmentally diverse sample, we confirmed gender differences in AM: women reported more emotionally intense memories than did men and narrated memories that expressed more emotional content than did males. Importantly, however, in self-report of emotional intensity, gender was mediated by gender typical identity, such that individuals who subscribed to more traditional feminine traits self-reported higher emotional intensity. Notably, the only measure of gender identity that mediated reported emotional intensity was subscription to stereotypically feminine traits, which overshadowed the relation of self-reported emotional sensitivity and emotional restrictiveness; subscription to stereotypically masculine traits was not related to self-reported emotional intensity. In contrast, when asked to narrate AMs, gender was related to expressed affect; of the four gender identity measures, only subscription to stereotypically masculine traits was also related, but did not mediate the effect of categorical gender.

Several critical conclusions emerge from this study. First, method matters. As we predicted, gender typical identity fully mediates gender differences using a reflective self-report measure, but does not mediate gender in the more implicit narrative measure. This suggests that self-report and narrative measures are measuring different aspects of self and identity. More specifically, questionnaires of gender typical identity and emotionality both

rely on explicit reflection on the self and its qualities. Individuals who subscribe to a more female stereotyped sense of self may also subscribe to more stereotypically female activities and values. Talking about the past is both more frequent and more valued by women than by men (Alea & Bluck, 2003), and reminiscing about the past is a stereotypically female activity (Fivush & Zaman, 2014). Therefore, self-report measures of AM may activate explicit gender identity, and individuals who subscribe to a stereotypically female gender identity may believe that their memories are more emotional. In contrast, narrative measures are more implicit, relying more on modes or behaviours that reflect implicit socialisation and gendered language that often operates outside of awareness (see Pennebaker et al., 2003; Pillemer, 2009; Tannen, 1990; and Waters et al., 2014, for further arguments). Implicit socialisation of gender focuses on emotions in ways that subtly signal to women, more than men, that emotional experience is an important way of being in the world, regardless of explicit subscription to gendered stereotypes (Gergen, 2001; Gilligan, 1982). In addition, women have substantially more practice engaging in conversations about past emotional experiences (Fivush & Zaman, 2014), enabling an autobiographical consciousness that defines the self and processes past experiences more often in reference to past emotional states, regardless of one's specific identification with feminine gender norms. Supporting this interpretation, gender differences on content measures such as affect are reported more consistently in the literature than gender differences in self-report measures, suggesting that implicit gendered identity may exert more influence on narrative measures, but explicit gender typical identity may exert more influence on explicit self-report measures. Thus, it is theoretically crucial to take method into account when interpreting findings on the emotional aspects of AM.

A second interpretation is that the self-report measure and narrative measures are measuring different aspects of emotion and AM. Especially, the PAQ-F asks about broader aspects of identity than just emotional expression. Yet, we found that this measure of gender identity mediated self-report of emotional intensity and not the narrative expression of affect. So it is not clear that these differences in focus between self-report and narrative would have produced the differences in mediation. Still, the findings indicate, not surprisingly, that in thinking about gender differences, we need to think carefully about the specific dimensions of memory quality and content. The prediction may not be that there are gender differences in the emotional aspects of AM, but rather specific dimensions of emotional experience and expression are "gendered". Integrating this with the first interpretation, we might argue that some aspects of gender, such as emotional expression, are socialised at such an implicit pervasive level that they become part of an implicit gendered way of being in the world (Fivush & Zaman, 2014; Gergen, 2001; Tannen, 1990).

Obviously, categorical gender is not an explanatory variable. The sociocultural theory of AM points to socialisation during parent-guided reminiscing as important in producing gendered narrative recall, and, indeed, the most consistent gender differences in parent-child reminiscing are that parents express more emotion with daughters than with sons (Fivush & Zaman, 2014), suggesting socialisation as a mechanism for the gender differences obtained here. Despite our orientation towards the sociocultural theory, we recognise that identifying a unique developmental cause is not a straightforward task and that multiple influences are continuously present. For example, females and males may be genetically and/or biologically predisposed to process information about emotions differently, and there is some suggestion in the neuroimaging literature that there are gender differences in the neural response to emotional stimuli even early in development (Bauer, Stevens, Jackson, & San Souci, 2011). Thus, any full explanation of gender differences in AM will involve a complex dynamic bio-social model.

Finally, we note that we sampled a wide adult age span, from early through middle adulthood. We see this as a strength of our study, in expanding the range of participants from the often used sample of college students. College students, in particular, may be less gender stereotyped than the rest of the population; they are focused on educational achievement and professional goals (Kroger, 2003). As individuals navigate early and middle adulthood, life experiences heighten an awareness of gender, especially regarding family and children, and individuals display more heavily stereotyped beliefs around gender (Katz-Wise, Priess, & Hyde, 2010; Lachance-Grzela & Brouchard, 2010). Thus, focusing research mainly on college students may obscure gender differences in the larger population, as we found here. In support of this suggestion, several studies focusing on older adults have found gender differences in emotional aspects of AM (Pillemer, Wink, DiDonato, & Sanborn, 2003). Additional support comes from the effect sizes found in this study. Effect sizes in gender comparisons in AM studies are often small, when they are reported at all (see Gryzman, 2014), and those found here were larger than are commonly reported, especially for self-reported emotionality. These larger effect sizes can be attributed to the inclusion of gender identity as a predictor and to the careful selection of a sample that includes a wider adult age span.

Some limitations remain with regard to the data reported. First, masculine gender identity predicted lower use of affect language. This finding was not predicted or anticipated, but its' interpretation is rather straightforward, as participants identifying with a more stereotypically masculine identity used less affect language in their narratives, in line with stereotypes about masculinity. More interesting is that this finding raises the possibility that feminine and masculine gender identity interact with AM in different ways. The hypotheses in this study were constructed primarily regarding feminine gender identity, as AM is

considered to be a stereotypically feminine activity (Fivush & Zaman, 2014). Thus, suggestions emerging from findings relating to masculine gender identity must be explored further, especially as they were not predicted and are small in magnitude.

We also note that, as in most of the research on basic processes of AM, we did not screen participants for clinical pathology. Studies have shown links between overgeneral memory and disorders such as depression (Williams et al., 2007) and PTSD (Moore & Zoellner, 2007), and the presence of individuals experiencing these disorders could introduce a source of bias in narrative analyses. However, it is not clear how the possible presence of pathology could account for the gender identity findings reported here. On a related note, we scanned the memory narratives carefully and did not find participants whose narratives raised concerns about specificity or about following instructions. Although this limitation should be considered for future research, it does not compromise the quality of the data presented.

Both the sociocultural theory of AM and dynamic models of gender identity focus on developmental processes. Future studies need to take a more developmental perspective to understand how gender, emotion, and AM develop dynamically across the lifespan. These are critically important questions for multiple reasons. First, understanding these gender differences across the lifespan will add theoretically to understanding AM more broadly. Second, individual differences in the emotional aspects of AM are related to individual differences in both identity and health, and likely show dynamically evolving relations across the lifespan. In terms of identity, if a focus on emotions is deeply embedded in how women understand their experiences to a greater extent than men, then this has implications for gender differences in processing of emotion in ways that can provide theoretical bridges across these literatures. In terms of health, women are at greater risk for emotionally based psychopathology, including depression and anxiety disorders, and gender differences in AM have been implicated in etiology (Salmon & O'Kearney, 2014). Thus, a more complete understanding of gender difference in AM is critical in furthering our understanding of health outcome.

Gender identity is a dynamic process that can be more or less apparent to some individuals and more or less elicited by some contexts (Deaux & Major, 1987). This study demonstrates how the dynamic nature of gender can be expressed variably across measurement techniques and can deepen an understanding of AM itself and the influences of gender thereupon. Both implicit and explicit gender identity influence the emotional quality of memories, but the processes are complicated. Results point to the importance of carefully crafted and theoretically motivated methods for studying gender and gender identity, and to the central roles these factors play in deepening models of emotion and AM.

Disclosure statement

No potential conflict of interest was reported by the authors.

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