

Women's Work: Remembering Communal Goals

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Building on evidence that people coordinate mnemonic work, the current paper evaluates whether women exert greater mental effort than men to remember outstanding goals for which other people are beneficiaries. We demonstrate support for the notion that men and women expend unequal effort to encode and track *communal goals*: outstanding goals that benefit others. Studies 1a–1e demonstrate that women are assumed to be more communal in their remembering than men. Studies 2 and 3 explore the merit of this common assumption. Focusing on the coordination of mnemonic work among romantic couples, Study 2 demonstrates that women are far more likely than men to encode outstanding goals for which their partner is a beneficiary. Study 3 replicates the communal memory effect experimentally with ad hoc dyads and rules out the possibility that the effect is rooted in a gender difference in mnemonic ability. The heightened expectation for women to be communal may manifest not simply as an increase in physical communal labor (e.g., household labor) but as an increase in mental communal labor as well. Implications of these results for home and workplace performance are discussed.

Keywords: collective memory, division of labor, gender, prospective memory, sex roles

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A wealth of literature suggests that women are more likely than men to concern themselves with others' welfare (e.g., Eagly, 1987/2013; Eagly & Johannesen-Schmidt, 2001; Eagly & Karau, 2002). We propose this communal tendency manifests as increased effort toward remembering to enact goals for which others are beneficiaries. The present investigation examines whether men and women devote different

amounts of effort to *prospective remembering*—remembering to perform a planned intention at some future point in time (Ellis, Kvavilashvili, & Milne, 1999; Harris, 1984)—when others benefit from their doing so.

Across seven studies, we test whether women and men allocate different levels of effort to prospective remembering of goals that benefit others, which we define as *communal goals*. Given that women are socialized to be concerned with others (Eagly, 1987/2013; Eagly & Johannesen-Schmidt, 2001), we predicted both that people expect women remember to enact outstanding communal goals more frequently than men, and that women actually do so. Contrary to the argument that this gender difference in prospective remembering simply reflects a capacity difference, we test and present evidence consistent with the argument that the difference is rooted in the amount of mental effort the two genders exert to remember to

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implement outstanding communal goals. In so doing, our findings highlight a previously overlooked form of labor that may be inequitably divided: mnemonic labor.

Women Act More Communal

Women are widely assumed to be communal, or concerned with the welfare of others, rather than focused on personal achievement (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Deaux & Lewis, 1983; Eagly, 1987/2013; Eagly & Johannesen-Schmidt, 2001; Eagly & Karau, 2002; Haines, Deaux, & Lofaro, 2016; Williams & Best, 1982; Wood & Eagly, 2002; Wood, Rhodes, & Whelan, 1989). These assumptions, or *descriptive* stereotypes, matter in part because they become standards against which women's behavior is judged by others and by themselves (Eagly & Karau, 2002; Heilman, 2001; Heilman, Wallen, Fuchs, & Tamkins, 2004; Rudman & Glick, 1999, 2001; Witt & Wood, 2010; Wood & Eagly, 2007). That is, descriptive stereotypes can become *prescriptions* for socially acceptable behavior. Facilitating the progress of others toward their goals is a core aspect of female gender stereotype prescriptions, which direct women to be helpful and supportive of others (Eagly, 2009; Heilman, 2012; Prentice & Caranza, 2002).

The expectation that women should enact behaviors that support others' goals is believed to dictate a range of helping behaviors (e.g., Becker & Eagly, 2004; Duncombe & Marsden, 1993; Simmons, Klein, & Simmons, 1977), in a range of situations (e.g., Farrell & Finkelstein, 2007; Heilman & Chen, 2005), and across different interpersonal relationships (e.g., Eagly, Johannesen-Schmidt, & Van Engen, 2003). Past evidence suggests that the inclination women have for being communal translates into a tendency to prioritize others' goals ahead of their own (Bernard, 1981; Chodorow, 1978; Eagly, 2009; Eagly & Steffen, 1986; Haines et al., 2016; Miller, 1976; Piliavin & Unger, 1985; Staub, 1978; Underwood & Moore, 1982) and suppress and regulate their own emotions in the service of relationship goals (Duncombe & Marsden, 1993), to name just a few ways in which women and men differ in how they support others' goals.

The present investigation seeks to extend this line of research by garnering evidence

that women's tendency to concern themselves with others' needs and welfare also inclines them to do more mental work in the form of prospective remembering. Whereas past work has focused on gender differences in the implementation of collective work (Fraidin & Hollingshead, 2005; Hollingshead & Fraidin, 2003), the present investigation shifts the spotlight of inquiry to the mental work that goes along with implementation, such as remembering which subtasks need to be done by when, and noticing when enactment opportunities arise. Existing research on the distribution of labor in the home speaks to which gender is more likely to do the laundry, take the family's dog to the veterinarian, do the grocery shopping, and so forth (women; Bianchi, Milkie, Sayer, & Robinson, 2000; Casper & Bianchi, 2009; Fenstermaker, 1985; Hochschild, 1989; Hook, 2006; Kan, Sullivan, & Gershuny, 2011; Pettit & Hook, 2009; Robinson & Godbey, 1997; Shelton & John, 1996). Here, we seek evidence that women are also more likely than men to manage the *mnemonic labor* around such activities—doing such things as tracking the state of the laundry and remembering to initiate its cleaning, remembering when the dog went to the veterinarian last and reminding oneself to make a new appointment, and noticing when the family needs more milk and recalling the outstanding need later in a moment in which it can be fulfilled (e.g., on the drive home from work).

The existing literature on the division of labor is largely concerned with gender differences in the *physical implementation* of shared work (cf. Hochschild, 1989), but as Ahn, Haines, and Mason (2017) recently highlighted, the genders may also differ in their willingness to undertake shared work that takes a more *mentalistic* form. One underappreciated way in which this tendency to be concerned with others may manifest is as a heightened attentiveness to outstanding tasks, goals, and responsibilities that, if successfully implemented, would benefit others. To provide context for the motivation of our studies, we summarize research that speaks to the processing challenges posed by prospective remembering and the literature on collective memory (i.e., transactional; Wegner, 1986) before providing an overview of our empirical approach.

Remembering to Act on Outstanding Goals Is “Labor”

For many reasons, people cannot always fulfill their goals as soon as they commit to pursuing them; the world regularly presents compelling reasons for delaying goal pursuits and reinstating the efforts at more appropriate future moments. The study of how people remember and act on unfulfilled goals in light of these circumstances is the chief subject of inquiry among prospective memory researchers (e.g., Einstein & McDaniel, 2005; McDaniel & Einstein, 2007). Prospective memory researchers are concerned with how people encode, maintain, and retrieve goals that cannot be enacted at the time that they are conceived but must be fulfilled in a future situation or point in time, and the mental costs in doing so (Cohen, Jaudas, & Gollwitzer, 2008; Gollwitzer, 1999; Loft & Yeo, 2007; McDaniel & Einstein, 2007; Smith, 2003; Smith & Bayen, 2004; Smith, Hunt, McVay, & McConnell, 2007; West, Krompinger, & Bowry, 2005).

Attesting to the unique processing challenges this particular form of remembering poses, forgetting to enact planned goals is the most common everyday memory failure, accounting for at least 50% of memory failures (Crovitz & Daniel, 1984; Kliegel & Martin, 2003; Terry, 1988; cf., Harris, 1984; McDaniel & Einstein, 1993). Failures in remembering to act on outstanding goals occur because opportunities to enact a delayed goal are often transient and tend to arise when one is already engaged in an ongoing task, making it easy to overlook the relevance of the current moment to fulfilling the delayed goal (Brandimonte & Passolunghi, 1994; Ellis & Nimmo-Smith, 1993; Harris & Wilkins, 1982). For instance, success at replacing an empty carton of milk requires recalling that outstanding goal in a circumscribed window of time—between picking your children up at school and pulling into the driveway of your home, for instance—despite its irrelevance of the task at hand of driving. An intruding thought about a milk carton does nothing to forward one’s current goal of beating the traffic home, yet absent such an intrusion, one is likely to forget the need altogether. Enacting delayed goals requires that one not just remember what one needs to do (e.g., purchase milk), but also that one self-remind about the goal’s existence, ideally in moments in which it can be enacted.

The need to self-initiate retrieval of goals (i.e., self-remind) in settings where they can be enacted is a defining feature of prospective memory. It distinguishes it from other forms of remembering (e.g., semantic, episodic, procedural) and explains why prospective remembering is especially difficult and resource-consuming. Although evidence suggests that people can alleviate this information-processing burden by relying on retrieval cues in the external environment (e.g., McDaniel, Guynn, Einstein, & Breneiser, 2004; Vortac, Edwards, & Manning, 1995), whether this form of remembering can ever be accomplished effortlessly is still hotly debated (e.g., Einstein et al., 2005; Smith & Bayen, 2004). Even scholars who believe that some prospective remembering can be accomplished on “auto-pilot” are quick to concede that it carries a processing cost in many goal-pursuit settings (e.g., McDaniel & Einstein, 2000; McDaniel et al., 2004). To some degree, people must remind themselves of outstanding goals in moments when their fulfillment is not only permissible but a priority.

If women are more inclined to attend, track, and self-initiate activities that have implications for others’ welfare than men, it follows logically that they spend more of their limited mental resources on the needs and aspirations of others.

Collective Remembering Behavior in Couples

An existing literature speaks to the idea that people, and couples in particular, coordinate remembering; they establish “collective memory systems” (Hollingshead, 1998a, 1998b; Ward & Lynch, 2017; Wegner, 1986; Wegner, Erber, & Raymond, 1991; Wegner et al., 1985). Until recently, that literature has primarily focused on how people coordinate the remembering of facts (i.e., semantic knowledge; e.g., where the flashlight can be found in the event of a power outage; Wegner et al., 1991). Ahn et al. (2017) established that couples also coordinate and share prospective remembering: they have an awareness of others’ outstanding goals and needs and help each other make progress toward their fulfillment. Ahn and colleagues present evidence that women are far more likely than men to *remind* partners about their partner’s outstanding goal (e.g., “Don’t forget that you

wanted to get your jacket tailored for your upcoming meeting”), presumably because women have a heightened awareness of their partners’ needs and monitor how much progress has been made toward fulfilling those needs.

The current paper converges on the possibility that there is a societal imperative on women to concern themselves with outstanding communal goals and that this duty may manifest in how they invest their limited mental resources. It builds on and extends the findings of [Ahn and colleagues \(2017\)](#) in two key ways. First, whereas [Ahn and colleagues \(2017\)](#) measured *acts of reminding* as a means to probe which gender is more communal in their remembering behavior, the present investigation provides cleaner evidence of the phenomenon because it measures *actual remembering behavior* (see Study 3). Second, Ahn and colleagues speculated that the gender imbalance in collective mnemonic work among couples may not be a consequence of women having a higher general capacity to remember outstanding goals but instead reflect a heightened motivation to meet societal standards of communality. The current investigation directly tests whether this gender difference in remembering to enact outstanding communal goals is rooted in a difference in *motivation* or *capacity* to do so (see Study 3).

Extensiveness of Difference in Mnemonic Labor: Bundled Versus Gendered Account

If our prediction about a gender difference in this type of mnemonic labor is borne out in the data, it raises an interesting question: Does it exist because (a) women tend to be responsible for communal tasks, and responsibility for remembering tasks tends to fall to the person who is expected to implement it, or (b) this type of remembering is itself gendered? We refer to the former possibility as the *bundled* account and the latter as the *gendered* account of mnemonic labor. These two accounts converge on the conclusion that females exert more mnemonic effort than males, but they diverge with respect to the extensiveness of this difference, with the gendered account characterizing the difference in labor as much larger than the bundled account. To begin to distinguish between these two accounts, the present investigation tests whether women are assumed to do more of this remembering even for tasks that are considered

“men’s work” or are gender-neutral (Studies 1a–1e). We also test whether women are inclined to do this remembering even for tasks that are their partner’s responsibility (Study 2). The primary aim of the present investigation, however, is to first establish that a gender differences in mnemonic-communal labor exists.

Study Overview

The aim of the present set of studies is four-fold. First, we seek evidence that women are assumed to exert more effort to remember to enact communal goals, and to assess whether this occurs in general (gendered account) or just for tasks for which they are presumed responsible (bundled account). Second, we seek evidence that these assumptions translate into societal expectations that lead to gender differences in this particular form of mnemonic behavior. We aim to establish that women exhibit greater communality in their prospective remembering behavior, and we aim to do so in a setting that involves romantic couples. Third, we seek evidence that such tendency also occurs in a controlled laboratory setting. Fourth and finally, we aim to gather evidence that this gender difference in mnemonic labor is rooted not in any capacity difference; rather, it is rooted in a difference in the genders’ motivation. Finding support for these four aims would imply that an important but overlooked facet of gender differences in being communal is how much mental labor women do versus men for tasks that benefit others.

Studies 1a–1e establish that women are assumed to perform this mental labor even for tasks for which they are not responsible or that are considered “men’s work” by having samples of Mechanical Turk participants read vignettes about remembering behavior and guess the gender of the protagonist. Study 2 builds on these results by showing the assumption that women expend greater mnemonic effort than men on tasks that benefit others extends to actual in situ behaviors. When asked to freely recall their outstanding goals, women in romantic couples were far more likely than men to list goals for which their partner or family is a beneficiary. Study 3 assigned participants to mixed-gender dyads and measured how manipulating who benefitted from remembering outstanding goals assigned to the dyad—just the person responsi-

ble for the goal or the dyad as a whole—shaped the pattern of recall by male and female members. This design permitted testing for a gender difference in mnemonic-communal labor in a controlled setting and establishing the effect is rooted in a heightened motivation to remember to enact communal goals and not a consequence of women having a higher general capacity for prospective remembering.

All measures and exclusions in these studies are reported herein or in the [supplemental online materials](#) [SOM] section. The sample sizes for our studies were exogenously determined in advance according to the authors' intuitions about likely effect sizes and required statistical power. All studies were conducted in accordance with the Institutional Review Board.

Studies 1a–1e

The primary aim of Studies 1a–1e was to obtain evidence that people assume women exert more mental effort than men toward remembering to enact outstanding communal goals.

Studies 1a–1e all present fictitious vignettes that introduce a male and female character, and then measure participants' beliefs about which character (male or female) does more prospective remembering for a communal goal. In every study, both characters have equal responsibility for the communal goal and equal stake in the successful outcome of the goal. Studies 1b, 1c, and 1e tested whether people assume that women are more likely than men to *remember to enact* communal goals. Studies 1a and 1d measured whether people assume that men are more likely than women to *forget to enact* communal goals.

A secondary aim of these studies was to gather preliminary data that might help distinguish between the *bundling* and *gendered* accounts of differences in mnemonic work. People may assume whomever is in charge of implementing a goal is also in charge of remembering to enact it. Women may be presumed to do more mnemonic work because the activities for which they are traditionally responsible—that are “women's work”—tend to be activities that benefit a greater collective. If that is the end of the story, women should be assumed to do more prospective remembering, but only for stereotypically female activities or for which they are explicitly responsible. If the remember-

ing of communal goals is itself gendered, people should assume women exert more mental effort than men toward remembering to enact outstanding goals that are gender-neutral or stereotypically “men's work.” Studies 1a–1e tested participants' assumptions about mnemonic work in vignettes that featured activities that are considered “highly female” (Study 1a), gender-neutral (Studies 1b and 1c), “male” (Study 1d), and “highly male” (Study 1e).

Method

Participants. Between 88 and 114 adults per study were recruited via Amazon's Mechanical Turk (Mturk) in exchange for monetary compensation. Study participants were fluent in English, resided in the United States, and had worked at least 20 hr per week before at a remunerated job. A portion of the 501 participants failed the attention-check measures that were included as quality control (1a = 9; 1b = 6; 1c = 21; 1d = 0; 1e = 0), leaving data from a total of 465 participants across the five studies (39.10% female; ages 19 to 71, $M = 33.94$, $SD = 9.64$; 9.41% African American, 10.31% Asian, 74.51% White, 4.68% Latino/Hispanic, 2.00% Other) for analysis. For a detailed breakdown of demographics by study, please see the [SOM](#), Table 2.

Stimulus materials and procedure. Participants read a vignette that presented a fictional account of a woman and a man with shared responsibility to remember to enact communal goals. The vignettes staged scenarios in which communal goals might arise in different settings. Importantly, the vignettes were worded such that it was clear to participants that the man and woman had equal responsibility for, and equal stake in, the execution of the outstanding communal goal (see [SOM](#) for exact wording). All of the vignettes explicitly measured participants' assumptions about which gender exerted more mental effort toward remembering an outstanding communal goal.

To begin to assess whether prospective remembering of communal goals is assumed to be performed by women regardless of goal involved (*gendered* account), or whether people assume that women are more communal in their remembering because they are generally in charge of implementing communal goals (*bundled* account), the vignettes featured activities

that ranged in stereotypicality from “highly female” to “highly male” according to participants in a pilot study (see SOM for details on pilot testing of the activities).

Study 1a featured an activity considered “highly female” by participants in our pilot study (childcare duties; rating $M = 1.60$ $SD = 0.76$, where 1 = *highly female* and 5 = *highly male*). Participants read about how long-married and dually employed Christina and Christopher have agreed to split housework, car maintenance, and childcare responsibilities 50–50, but one of them forgets to implement a goal related to the care of their 2-year-old. Participants’ assumptions about which gender was less likely to remember to enact this communal goal was assessed with a single, forced choice item: Study 1a asked participants to indicate whether Christina or Christopher forgot to enact their childcare duty.

Studies 1b and 1c featured activities that were rated gender neutral by participants in the pilot study (calling clients [$M = 2.88$, $SD = 0.98$] and payroll duties [$M = 3.14$, $SD = 1.00$], respectively).

In Study 1b, participants read about Sam and Sarah, who are co-owners of a small, jointly founded firm with six major clients. These six clients generate the bulk of the revenue for their firm. Participants learn that they are each in charge of calling three of these six clients. This week, one of them explains that they forgot to call one of three of their assigned clients (the other person remembered to call all three). Study 1b participants were asked to choose whether Sam or Sarah was the one who forgot to call an important client for their company.

Study 1c participants learned about John or Jill, who comanage a sales team. Participants were told that each of them needs to remember to complete a set of payroll goals each billing cycle. These goals were communal in that they benefitted the members of their co-led team: Participants were explicitly informed that failure to perform the goals could delay employees’ paychecks. Finally, they were told that one of these individuals only remembered to do half of their billing goals, whereas the other remembered all but one. They were then prompted to indicate whether John or Jill would be the one who remembered “all but one” communal goal. In other words, they were asked to indicate which person undertook more mnemonic labor.

Study 1d featured an activity that was considered “male” (debugging their co-led team’s code; $M = 4.07$, $SD = 0.93$) and Study 1e featured one that was considered “highly male” (checking the oil in the family’s car; $M = 4.52$, $SD = 0.74$). Study 1d participants read a vignette in which Paul and Polly are co-leads on a project team at a midsize software company. Each of them must remember to review a portion of software code; failure to do so could delay their project launch. Study 1e participants were asked whether Paul or Polly were more likely to remember to debug their co-led team’s code.

In Study 1e, participants read a vignette where a long-married couple, Jim and Jenny, split all household work 50–50, including vacation planning. Every August, they take a much-anticipated trip to Maine to visit old friends. Failure to remember goals related to their upcoming annual road trip to Maine could delay it and cause them to miss part of their vacation. Participants were asked to indicate whether Jim or Jenny remembered that the family’s car oil needed to be checked before they hit the road.

In all studies the order of the names was counterbalanced such that a given name appeared first for half of participants and second for the other half. A single, multiple-choice question followed, verifying that participants paid sufficient attention to details from the vignette (e.g., “The bulk of Sarah and Sam’s company revenue is dependent on how many clients?”). Participants provided demographic information and then received their compensation.

Results and Discussion

The primary aim of Studies 1a–1e was to test for the existence of descriptive norms that women are more inclined to remember communal goals. Consistent with this possibility, chi-square goodness of fit tests revealed the majority of participants in Studies 1a–1d assumed the woman was more likely to remember outstanding communal goals, and/or the man was more likely to forget them (all $ps < .001$; see Table 1). Across the four studies, these findings emerged when we restricted our analyses to female participants, and when we restricted it to male participants (see SOM for all analyses).

The secondary aim of Studies 1a–1e was to begin to shed light on whether people assume

Table 1
Results From Studies 1a–1e

Study	1a Childcare	1b Call client	1c Payroll	1d Debug code	1e Check oil
<i>N</i>	90	94	79	88	114
Said woman remembered	83.33%	79.79%	73.42%	71.59%	23.68%
Chi-square (χ^2)	40.00	33.36	17.33	16.41	31.58
<i>p</i> value	<.001	<.001	<.001	<.001	<.001
Cramer's V (ϕ C)	.67	.60	.47	.67	.59

women remember to enact communal goals because they are in charge of implementing goals that are communal (*bundling* account), or whether this form of prospective remembering itself is gendered (*gendered* account). Results revealed that women were assumed to do more mnemonic communal labor than men not just for goals that are considered “highly female” (childcare duties; Study 1a), but also goals that are gender-neutral (billing activities, Study 1b; calling clients, Study 1c) and even a goal rated as “male” (debugging computer code, Study 1d). If remembering to enact communal goals was merely “bundled” with the obligation to implement them, women would not be assumed to have remembered goals in gender neutral or

“male” scenarios. This result implies that this type of mnemonic labor may itself be gendered.

That being said, it is important to note that when we used a *highly male* activity (remembering to check oil in the family car) the pattern reversed: Study 1e participants assumed the man in the vignette was more likely to do the mnemonic labor around this activity than the woman, $\chi^2(1, N = 114) = 31.58, p < .001$ (see Table 1). It would seem then that this particular form of mental labor is gendered except when the remembering entails goals that are *highly male*. Under that condition, people “bundle” or assume males are in charge of both goal implementation and the mnemonic labor around implementation. Figure 1 depicts this relationship.

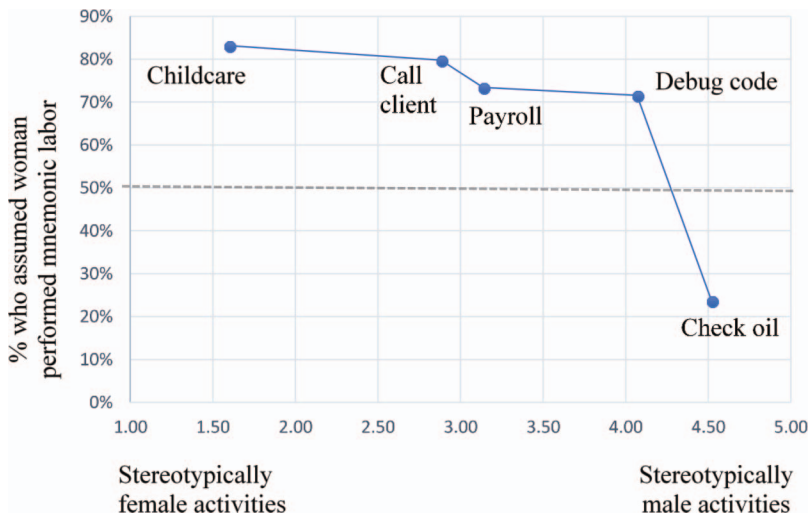


Figure 1. Results of Studies 1a–1e. This figure shows the percentage of participants that believed the woman remembered to enact the communal goal (y-axis) plotted over the ratings of how stereotypically male or female the vignette activities were rated as being by a separate group of M-Turk participants (see SOM). See the online article for the color version of this figure.

In sum, results indicate that both genders hold the same descriptive stereotype: women are more inclined to remember to implement all but the most “male” of outstanding activities.

This finding begs an important question: Does this assumption translate into action? Social role theory would suggest so; individuals internalize social norms as standards for their own behavior and the behavior of others (Eagly & Wood, 2012). Study 2 seeks evidence that this assumption is reflected in women’s versus men’s actual mnemonic behavior.

Study 2

Studies 1a–1e presented evidence that women are assumed to do more remembering of outstanding goals for which others are beneficiaries (i.e., communal goals) than men. Study 2 examined the validity of this belief by having members of romantic couples freely recall outstanding goals they needed to remember to implement and then having them indicate the extent to which the implementation of each goal would benefit others.

If women are assumed to do more mnemonic labor from which others benefit, one might reasonably expect it to be normative for women to behave in this manner. Consistent with this possibility, and with evidence that women face heightened prescriptive norms to be communal (e.g., Eagly & Wood, 2012), we predicted (a) a difference in the number of outstanding communal goals that are accessible in the memory of men versus women and (b) a difference in the cumulative benefit all the outstanding communal goals accessible in the memory of men versus women.

It is important to highlight that our argument does not predict that women’s outstanding goals benefit others more *on average* than men’s outstanding goals. As in the literature on the division of work in the household, the *average* activity of men and women matters less than how much *total work* each performs and its *cumulative benefit* to others. We therefore compare the *total amount of communal goals* each member of the couple performs and the *cumulative benefit* this prospective remembering has for others.

Although the core aim of the present investigation was to show that women exert more effort to remember to enact goals whose imple-

mentation would benefit others (i.e., *communal goals*), a secondary aim was to assess whether women are inclined to do this mnemonic labor even for goals whose implementation is not their responsibility (see Ahn et al., 2017). For instance, are women also more likely than men to have “in mind” their partner’s need to set up a dentist appointment? We test for this possibility by comparing the number of goals that are accessible in the memory of men and women that are strictly their partner’s responsibility to implement. Evidence that women are disproportionately aware of and attuned to their partner’s outstanding goals would not only speak to the robustness of their inclination to do mnemonic work on behalf of others, but also provide converging evidence that this type of remembering may itself be gendered.

Method

Participants. A total of 86 individuals (50% female; ages 20 to 58, $M = 32.55$, $SD = 8.46$; 8.5% Asian, 5.1% Black, 3.4% Latino/Hispanic, 76.3% White, 6.8% Other/Mixed Race) who comprised 43 heterosexual, romantic couples were recruited via campus outreach. To qualify for the study participants had to (a) be fluent in English, (b) have resided in the United States for at least one year, and (c) have a part- or full-time job. In addition, (d) the romantic relationship needed to be at least 1 year old ($M = 8.94$ years, $SD = 7.81$) and (e) the couple had to be cohabiting. In exchange for their time, participants were given monetary remuneration.

Procedures. Both members of the couple were escorted into the lab and instructed to provide informed consent. The experimenter explained to the couple that the study was concerned with memory and that it would involve asking them to reflect on and report things that they need to remember to do—outstanding goals or “to dos.” Each participant was then seated at a computer and told to spend the next four minutes listing in an Excel spreadsheet any goals that they needed to *remember* to resolve. The experimenter explicitly stated that these goals could be from multiple domains, including home, work, familial, and social life.

After four minutes had passed, the experimenter expanded hidden columns on the spreadsheet into which participants were instructed to rate the goals they listed along a few

dimensions. Specifically, participants rated the extent to which completing each goal would benefit (a) themselves, (b) their partner, and (c) “the collective” (i.e., their partner and any other dependents, such as children), all on a scale that ranged from 1 = *not at all* to 9 = *very much*. Participants also rated how important it was in general to complete the goal (1 = *not at all* to 9 = *very much*), and whose responsibility it was to complete the goal (1 = *self* to 9 = *partner*, with the midpoint representing a shared responsibility).

To address any potential concerns that participants’ perceptions of the goals they listed may not be objective or that males and females use different standards when judging the extent to which others benefit from different actions, for a given goal recalled, we had *both* members of the relationship provide ratings. After each member of the couple finished rating the outstanding goals that they had personally recalled, the experimenter then hid the participant’s benefit/importance/responsibility ratings and had the two participants switch seats. The experimenter then explained that they were each going to repeat the rating task, only this time they were going to provide benefit/importance/responsibility ratings of the outstanding goals that were recalled and listed by their partner. The experimenter then expanded another set of hidden columns into which each participant inserted their ratings of each outstanding goal that was recalled by their partner. This approach permitted testing the cumulative benefit to others of goals recalled by females was higher than that of males, regardless of whether the person rating the goal was a female or her partner.

Lastly, participants completed a survey that collected demographics (gender, race, age) and possible relevant moderators, such as income and couples’ characteristics (e.g., perfectionism, Almost Perfect Scale–Revised, Slaney, Rice, Mobley, Trippi, & Ashby, 2001; Relationship closeness, the Inclusion of Other in Self Scale, Aron, Aron, & Smollan, 1992).

Data coding and analytic strategy. It is possible that women expend more mental effort to keep track of outstanding goals—as is evidenced by the finding that they recall significantly more outstanding duties—but that they are the sole beneficiaries of this labor. To the contrary, we predict women do far more mental work in which others will benefit than men. If

women expend more effort encoding and maintaining in memory outstanding *communal goals*, we would expect two reliable patterns in the data. First, women should recall and list a significantly higher number of communal goals. The *count of communal goals* recalled by women—goals rated as a benefit to their partner/collective—should be higher for women than the count of communal goals recalled by men. Second, the *cumulative communal benefit* (i.e., the summation of benefit ratings to their partner and/or the collective) of all the outstanding goals listed by women should be greater than the cumulative communal benefit of the goals listed by men.

Each participant was instructed to provide benefit ratings for each goal they recalled (“To what extent will your partner/the collective ultimately benefit from this goal being enacted?”) as well as each goal their partner recalled (“To what extent will you benefit/the collective ultimately benefit from this goal being enacted?”). We therefore have ratings of the extent to which a given participant believed his partner and the collective benefitted from each of the goals he listed, which we refer to as *communal benefit ratings of self-recalled goals*, and ratings by the participant’s partner of the extent to which she felt both she and the collective benefitted from the goal he listed, which we refer to as *communal benefit ratings of partner-recalled goals*. This feature of the research design permitted testing whether a participant’s views on the extent to which the goals he listed benefit others were consistent with their partner’s views. If the pattern of results obtained using ratings of self- and partner-recalled goals converge, we can have greater confidence that participants were fairly objective and using the same criteria to judge which goals are “communal,” or beneficial to others.

In our first set of analyses where we test for gender differences in the number of communal goals recalled and listed, we accounted for the fact that these count data were bounded at zero and positively skewed by modeling the data with the GENLINUX procedure in SPSS (SPSS, Inc., 2012) and specifying a Poisson distribution with a log-link function. In the second set of analyses, where we test for gender differences in the cumulative communal benefit of the listed goals, we submitted the data to multilevel analyses. In both analyses, gender

was modeled using fixed effects while intercepts and error components across couples were allowed to vary randomly to account for variance across couples. We used the MIXED procedure in the statistical package SPSS to implement mixed-effects models of within and between couple effects on outcome measures (Heck, Thomas, & Tabata, 2013; SPSS, Inc., 2005). In calculating p values for regression coefficients, we used the MIXED procedure in SPSS to run models through Satterthwaite approximation tests to estimate the degrees of freedom scale the model estimates to best approximate the F -distribution (Heck, Thomas, & Tabata, 2013). Tests of nonindependence and distinguishability indicated that dyads were the correct unit of analysis and that individuals within couples were distinguishable by gender (Kenny, Kashy, & Cook, 2006).

Results

Gender difference in the number of communal goals recalled.

Communal goals for which partner is a beneficiary. We first tested whether women recall a significantly greater number of communal goals for which their partner is a beneficiary as compared with men. We operationalized “communal goal” as any goal where the benefit rating to the partner was equal to or higher than a ‘2’ rating (otherwise the goal was considered purely a personal goal; recall that the benefit scale ranged from 1 = *not at all* to 9 = *very much so*). When we compared the number of *self-recalled goals* that females felt were of benefit to their partner to the number of *self-recalled goals* that males felt were of benefit to their partner using this criteria, we found that the former figure ($M = 12.17$; $SD = 6.21$) was significantly greater than the latter one ($M = 9.09$, $SD = 5.37$), $\beta = 0.29$, $SE(\beta) = 0.07$, $t(1,42) = 4.29$, $p \leq .001$. Similarly, when we compared the number of *partner-recalled goals* that males felt they benefitted from (i.e., rated a ‘2’ or above) to the number of *partner-recalled goals* that females felt they benefitted from, we found the former figure ($M = 11.98$, $SD = 5.38$) was significantly higher than the latter figure ($M = 9.30$, $SD = 5.68$), $\beta = 0.25$, $SE(\beta) = 0.07$, $t(1,42) = 3.79$, $p \leq .001$. In sum, regardless of who was providing the benefit

rating—the participant who recalled and listed the goal or the participant’s partner—there was consensus around the view that women were maintaining a greater number of communal goals for which their partner was a beneficiary than men.

It is worth noting that this gender difference in the count of communal goals emerged when we used different cutoffs for selecting which goals were communal (i.e., of benefit to the partner). These effects replicate when we operationalize collective goals as those rated equal or above ‘2’ for self- and partner-recalled goals (as reported above). For self-recalled goals, the difference was statistically significant at all other thresholds (i.e., when we used the thresholds of greater or equal to ‘3,’ ‘4,’ ‘5,’ ‘6,’ ‘7,’ and ‘8’; all $ps \leq 0.01$). For partner-recalled goals, we continued to see the effect for goals at a threshold greater than or equal to ‘2,’ and ‘3,’ but not at higher thresholds (see Figure 2, panels A & B and the SOM for analyses at different cutoffs).

Communal goals for which “collective” is a beneficiary. We then considered whether this same pattern of results would emerge when comparing the number of communal goals for which the “collective” was a beneficiary that were recalled and listed by women as compared with men. When we compared the number of *self-recalled goals* that females felt were of benefit to the collective ($M = 12.47$, $SD = 6.02$) with the number of *self-recalled goals* that males felt were of benefit to the collective ($M = 9.23$, $SD = 5.92$), we found that the former figure was significantly larger than the latter, $\beta = 0.03$, $SE(\beta) = 0.07$, $t(1,42) = 4.53$, $p < .001$. Likewise, when we compared the number of *partner-recalled goals* that males felt the collective benefitted from with the number of *partner-recalled goals* that females felt the collective benefitted from, we found the former figure ($M = 13.35$, $SD = 6.09$) was significantly higher than the latter figure ($M = 10.05$, $SD = 6.03$), $\beta = 0.28$, $SE(\beta) = 0.06$, $t(1,42) = 4.46$, $p < .001$. In sum, regardless of who was providing the benefit rating—the participant who recalled and listed the goal or the participant’s partner—there was consensus around the view that women were maintaining a greater number of communal goals for which the collective was a beneficiary than men.

As was true with our analysis of the count of communal goals for which the partner was the

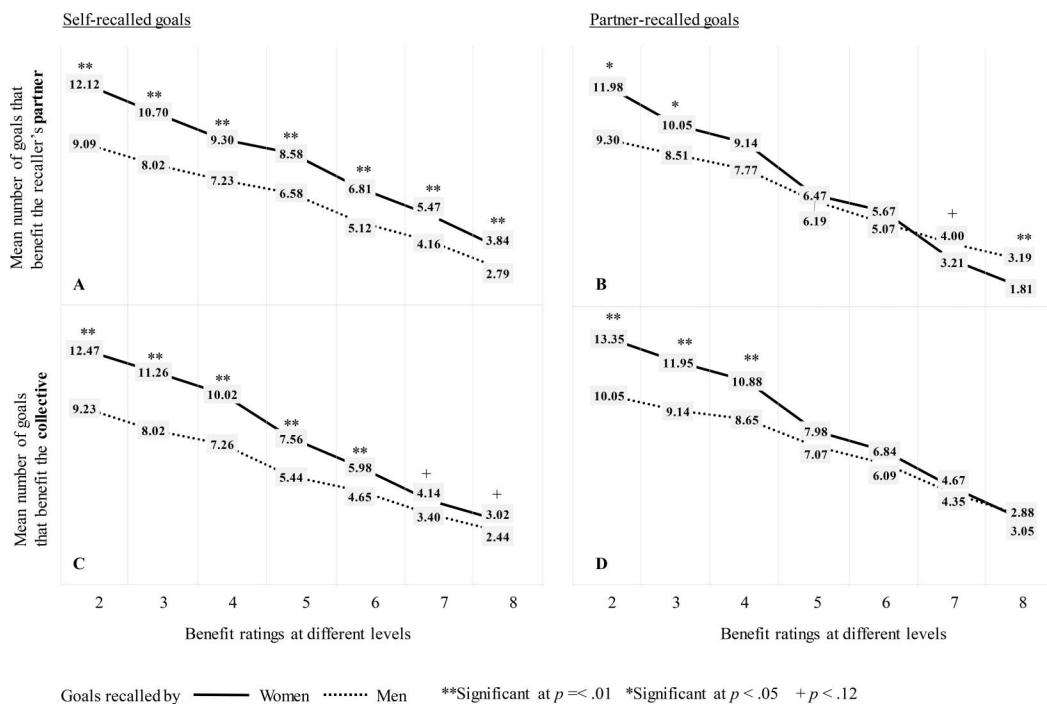


Figure 2. Number of communal goals recalled by self and partner at different levels of benefit ratings. This figure shows the mean number of goals recalled by men and women that benefit their partner or the collective at benefit ratings greater than or equal to “2” through “8”.

beneficiary, these effects replicate when we operationalize self-recalled collective goals as those rated above ‘2’ (as reported above), as well as those rated equal or greater than ‘3,’ ‘4,’ ‘5,’ and ‘6’ (all $ps \leq 0.01$; see Figure 2, panel C). For partner-recalled goals, the count differences were significant at ‘2’ (reported above) as well as at ‘3’ and ‘4’ (all $ps \leq .01$; see Figure 2, panel D and the SOM for analyses at different cutoffs).

Gender difference in the cumulative benefits outstanding goals bestow on others.

Cumulative benefit of outstanding goals to partners. In addition to assessing whether women are remembering a *greater number* of outstanding goals for which others are beneficiaries (i.e., communal goals), Study 2 assessed the *total benefit* to others bestowed by the prospective remembering by women versus men. Testing this latter prediction involved evaluating the cumulative benefits of participants’ recalled goals to their partners. As predicted, female participants’ ratings of how much the

goals they recalled *benefit their partners* was significantly higher ($M = 76.40$, $SD = 38.91$) than male participants’ ratings of how much the goals they listed as a whole *benefit their partners* ($M = 59.16$, $SD = 35.61$), $\beta = 16.09$, $SE(\beta) = 6.37$, $t = 2.53$, $p = .02$. Likewise, when the total *self-benefit ratings* of *partner-recalled goals* was compared, a trend emerged whereby women said they benefited less from the goals that their male partners recalled ($M = 68.44$, $SD = 40.77$) than men say they benefited from the goals their female partners recalled ($M = 78.79$, $SD = 31.90$), $\beta = 9.65$, $SE(\beta) = 6.52$, $t = 1.48$, $p = .15$. In sum, regardless of who was providing the benefit rating—the participant who recalled and listed the goal or the participant’s partner—there was consensus that the cumulative benefit to others from goals women maintain in memory is higher than that from men’s maintained goals (see Table 2).

Cumulative benefit of outstanding goals to the “collective”. A second set of analyses considered the cumulative benefits of partici-

Table 2
Sum Benefit of Communal Goals Recalled by Self or Partner

Goals recalled by	Benefit	According to	In this sum amount		Show women's goals bestow more communal benefit			
			<i>M</i>	<i>SD</i>	β	<i>SE</i> (β)	<i>t</i> (42)	<i>p</i>
Self	Partner	Women	76.40	38.91	16.09	6.37	2.53	.015*
		Men	59.16	35.61				
Partner	Collective	Women	84.63	38.84	19.29	7.08	2.72	.009**
		Men	64.52	41.52				
	Self	Men	78.79	31.90				
		Women	68.44	40.77				
Collective	Men	89.74	41.12	13.11	7.17	1.83	.075 ⁺	
	Women	75.31	46.38					

Note. The sum benefit of self-recalled and partner-recalled goals, determined by benefit ratings greater than 2. Note that ratings of '1' denote "not at all" and are therefore excluded from these analyses.

⁺ $p < .10$. * $p < .05$. ** $p < .01$.

pants' recalled goals to the greater family unit (i.e., the "collective"). As predicted, female participants' ratings of how much the goals they listed as a whole benefited the collective was significantly higher ($M = 84.63$, $SD = 38.84$) than male participants' ratings ($M = 64.52$, $SD = 41.52$), $\beta = 19.29$, $SE(\beta) = 7.08$, $t = 2.72$, $p = .01$. Again, both partners appear to agree about the difference: ratings of partner-recalled goals revealed that women rated the goals recalled by their male partners as benefiting the collective marginally less ($M = 75.31$, $SD = 46.38$) than men rated goals women recalled ($M = 89.74$, $SD = 41.12$; $\beta = 13.11$, $SE(\beta) = 7.17$, $t = 1.83$, $p = .075$).

Consistent with our predictions, both members of the couple indicate that the total benefit to others—both to the partner and the collective—of all the goals women recalled is higher than the goals that men recalled. This pattern of results emerged when analyzing benefits were furnished by the participant (i.e., the person who recalled the goal) and when analyzing the benefit ratings furnished by partners of the participant, although differences in the latter were in some cases less pronounced (see Table 2).

Taking on others' mnemonic labor: Gender differences in number of goals recalled that are a partner's responsibility. In addition to establishing that women exert more effort toward the prospective remembering of communal goals, we also sought evidence that women might be inclined to do this mnemonic labor even for goals whose implementation is not their responsibility. Such a finding would

converge with Ahn and colleagues (2017) on the idea that the female inclination to do mnemonic work on behalf of others is robust. Moreover, and consistent with the results obtained in Studies 1a–1d, such a finding would suggest these labor differences emerge in part because this type of remembering is itself gendered. Women may do remembering not just around the communal activities for which they are responsible but also for the activities for which they are not responsible. Consistent with this possibility, women recalled more goals for which the partner was entirely responsible to implement ($M = 0.44$, $SD = 1.03$) than did men ($M = 0.07$, $SD = 0.26$), a difference which was statistically significant, $\beta = 1.20$, $SE(\beta) = 0.42$, $t(1,42) = 2.88$, $p = .01$.

Discussion

Studies 1a–1e suggest that people assume that women are more inclined than men to do the mental labor necessary to remember to implement all but the most "male" of outstanding activities. Building on these findings, Study 2 suggests these descriptive norms translate into prescriptive norms for behavior, as women do indeed maintain in memory a greater number of outstanding communal goals. Moreover, we found the prospective remembering done by women as compared with men had greater cumulative benefit to others. Both of these differences emerged regardless of whether the person who recalled it or their partner was rating the goal, suggesting that these judgments are likely

accurate. We also found these differences regardless of whether the person furnishing the ‘benefit’ ratings was male or female, assuaging concerns that men and women have discrepant views on what constitutes a communal goal.

It is worth clarifying that our argument is not that women exhibit complete selflessness in their remembering behavior but rather that they are far more likely than men to undertake mnemonic labor to enact outstanding goals for which others are beneficiaries. In fact, when we compare the number of *personal goals* listed by men and women (i.e., goals for which the retriever is the sole beneficiary), we find that women list more ($M = 16.30$, $SD = 5.59$) than men ($M = 13.00$, $SD = 5.35$), $\beta = 0.23$, $SE(\beta) = 0.06$, $t(1,42) = 3.99$, $p < .001$. It may be possible that women do more prospective remembering than men across the board within romantic couples.

Of course, it is possible the differences in memory for communal goals observed in Study 2 reflect a gender difference in mnemonic ability versus effort. Indeed, Study 2 results indicate that women not only recalled more communal goals, but also recalled a significantly higher number of goals *overall* ($M = 17.88$, $SD = 6.04$) than did men ($M = 14.14$, $SD = 5.44$), $\beta = 1.75$, $SE(\beta) = 0.09$, $t(1,42) = 3.20$, $p = .003$. Perhaps women remember a greater number of communal goals for no other reason than because it is easier for them to do so. Study 3 seeks to address this potential shortcoming in an experimental setting that permits directly testing whether the observed gender difference in remembering and managing outstanding communal goals is rooted in a difference in *motivation* to enact goals that benefit others rather than a capacity difference.

Study 3

People assume that women will remember communal goals better than men (Studies 1a–1c), and this assumption bears out in real-world prospective memory behaviors: women, relative to men, appear to perform more mnemonic labor that ultimately yields benefits to others (Study 2). Study 3 sought to replicate these latter findings, to get clarity on the reason for this gender difference, and to garner evidence that the phenomenon generalizes to cross-sex

interactions among strangers (i.e., beyond couples).

Of chief consideration was whether the gender discrepancy in memory for communal goals reflects women’s heightened motivation for doing the mental work required to enact communal goals or whether it instead reflects a capacity difference—women may recall a greater number of outstanding goals simply because they have greater prospective remembering abilities. Although there is no compelling evidence of gender differences in prospective memory capacity (e.g., Bakker, Schretlen, & Brandt, 2002; Crawford, Smith, Maylor, Della Sala, & Logie, 2003; Efklides et al., 2002), additional evidence would strengthen our motivational account. Study 3 thus tests whether the genders differ in their ability to remember outstanding goals that are *personal* as well as *communal* in a controlled laboratory setting. If women simply have greater prospective memory abilities, they should outperform men no matter the identity of the beneficiary (themselves or others). If the difference is rooted in motivation, we would expect women to outperform men on communal goals but not personal goals.

To test these competing explanations, we assigned participants to mixed-gender dyads and measured whether and how manipulating who benefitted from remembering outstanding goals assigned to the dyad shaped the pattern of recall by male and female members. More specifically, across dyads we varied the incentive structure such that members of half of dyads were told that successfully remembering to implement an outstanding goal to which they were assigned would benefit them exclusively (i.e., personal goals), whereas members of the other half were told that both they and their partner would benefit from their successful implementation of the outstanding goal (i.e., communal goal), and then tested members’ memory for the outstanding goals to which they were assigned.

We also sought evidence that the gender difference in mnemonic work emerges early in the information processing stream, when these goals are being encoded into memory. If differences are detectable at early stages, it suggests that men exhibit less communality in their prospective remembering because they are less likely to attend and encode communal goals in the first place. Evidence of gender differences in the encoding of communal goals would not,

in and of itself, prove that the effect of interest is rooted in motivation. However, it would certainly bolster our argument that these differences are motivational because effective encoding critically depends on how much attention a stimulus is allocated (Chun & Turk-Browne, 2007; Craik, Govoni, Naveh-Benjamin, & Anderson, 1996) and people tend to attend information that has personal significance or importance. Given this additional empirical aim, the study was designed such that (a) the incentive structure varied only at goal encoding and not at goal retrieval and (b) the goal maintenance period was relatively brief in duration.

Method

Participants and design. A total of 142 Native-English speakers (50% female; age $M = 22.46$, $SD = 3.93$; 13.0% Black, 26.1% Asian, 37.0% White, 8.7% Latino/Hispanic, 2.2% Native American, 8.7% Mixed Race) participated in exchange for monetary compensation. With these 142 participants we formed 71 male–female dyads comprising people who were largely unfamiliar with one another: 91.30% were unacquainted, 4.30% were acquainted, and 3.26% were friends.

The experiment had a 2 (participant gender: male or female) \times 2 (context of goal encoding: personal or communal goals) between-participants design. Dyads were randomly assigned to one of the two goal-encoding conditions. We assessed how these two factors affected participants' ability to both freely recall and recognize goals to which they had been assigned.

Procedure and stimulus materials. Participants were scheduled so that they could be run in the study as part of a mixed-gender dyad. After consenting to participate in the study, participants were told they would each be assigned 12 goals (e.g., "remember to draw a tiny circle with the blue crayon") that they were responsible for remembering and subsequently implementing. The necessary supplies to perform the goals were strategically placed just outside the entrance of the testing room; participants passed them to enter. The experimenter explained she would read the list of to-be-remembered goals in an interleaved fashion, assigning goals to each member via an alternating finger-point. The experimenter added that after she read the list of goals twice, the partic-

ipants would perform an unrelated task and then be asked to fulfill their 12 assigned goals.

After the task was explained to participants but prior to actually assigning the goals, the experimenter implemented the encoding manipulation. Members of dyads who were assigned to the *personal goal* condition were told they *each* had an account with a balance of \$12, from which \$1 would be deducted for each assigned goal they failed to implement. We ensured that participants understood that their performance would not affect the monetary outcome of their partner. By contrast, members of the dyads who were assigned to the *communal goal* condition were told that although they were each going to be responsible for remembering and implementing 12 of the goals, their partner would have a stake in their performance. They were informed that the pair of them had a shared account with a \$24 balance, from which \$1 would be deducted for each goal that was forgotten. The balance would be split equally between them at the end of the experiment. Participants were further told that they could help their partner implement one of his or her goals, but only after they were finished attempting to implement all of the goals they had personally been assigned. In this way, we set up a division of labor among dyads that resembled how couples and work teams often operate: if someone is assigned a goal but fails to implement it, their partner may pick up the slack.

Stimulus materials were pilot tested to limit variation in the memorability of each of the assigned goals. Each goal had the same structure: one verb, two adjectives, and two nouns. To limit confounding effects of goal memorability, the presentation of the goals was counterbalanced such that a given goal was assigned to women in half of dyads and to men in the other half. To limit confounding order effects of goal assignment, the order in which the interleaved lists were read to dyad members was also counterbalanced such that half of the time the first goal was assigned to the female participant and half the time the first goal was assigned to the male participant. All stimuli can be found in the SOM.

After twice reading the list with clearly alternating finger-points that assigned half of the 24 goals to each participant, the experimenter administered a filler task: six logic problems to be completed in 2 min. At this point, the experi-

menter then implemented the recall memory phase of the study. Participants were informed that there would be two changes to the procedures. First, they were told they would write down the goals they remembered instead of actually implementing them because the experimenter was running short on time. Critically, we had no intention of having participants implement the work; our goal was to test how many goals each gender would encode as a function of the context in which they had to encode their goals—communal or personal—and their gender. To ensure that the manipulation affected the encoding of the outstanding goals but not their retrieval, participants were informed of a second change: despite what they had been told earlier, they would each earn \$12 regardless of how many assigned goals they were able to remember. This change was implemented to make sure that our manipulation was operating at encoding and not at retrieval (e.g., Frischen, Bayliss, & Tipper, 2007; Mason, Hood, & Macrae, 2004). We wanted to assess whether the incentive structure—whether or not other people are a beneficiary of prospective memory acts—shaped how much effort participants exerted to encode the goals and not how much effort they exerted to retrieve them. The experimenter urged them to do their best recalling the goals regardless of the change in the incentives.

The main dependent variable was participants' ability to freely recall outstanding goals. The experimenter measured participants' memories for the outstanding goals by having them freely recall and list on a piece of paper the goals which they were assigned. This provided our measure of recall performance. After having participants freely recall the assigned goals, they were administered a recognition memory test that featured the goals they were assigned as well as 20 lures (see SOM). Finally, participants were asked to provide demographics (e.g., age, gender, and race) and to indicate how familiar they were with their partners before being debriefed and dismissed.

Results

To determine whether the context in which the goals were encoded—personal versus communal—mattered and whether one gender was affected by it more than the other, we submitted

participants' recall performance scores to a linear mixed model (McCulloch, Searle, & Neuhaus, 2008). The model included a dummy regressor for dyad condition (personal/communal), a dummy regressor for participant gender (male/female), and a participant gender by condition interaction term, all as fixed factors. Dyad was also included in the analysis but as a random factor. A diagonal symmetry covariance structure was specified. Consistent with our prediction, results revealed a significant main effect of recall by participant gender, $F(1, 139) = 10.29, p = .002$, that was qualified by a significant participant gender and goal condition interaction, $F(1, 138) = 4.19, p = .04$. The main effect of goal condition did not reach statistical significance, $F(1, 139) = -1.035, p = .30$.

Inspection of the simple slopes revealed that female participants freely recalled more of their goals when their partner would benefit from their mnemonic labor (i.e., in the communal goal condition ($M = 83\%$, $SD = 16\%$) compared with when they were the sole beneficiary of their mnemonic effort (i.e., the personal goal condition; $M = 75\%$, $SD = 17\%$), $t(69) = -1.94, p = .06$, Cohen's $d = .46$). By contrast, the number of goals male participants recalled was no greater in the communal goal condition ($M = 70\%$, $SD = 12\%$) compared with the personal goal condition ($M = 72\%$; $SD = 13\%$), $t(69) = 0.83, p = .41$, Cohen's $d = -.19$.

The simple main effects of gender on goal recall were also examined. When their partner had a stake in their mnemonic labor, female participants recalled significantly more of their goals ($M = 83\%$; $SD = 13\%$) than did males ($M = 70\%$; $SD = 13\%$), $t(66) = -3.78, p < .001$, Cohen's $d = 0.92$. Critically, by contrast, the number of personal goals female participants recalled ($M = 75\%$, $SD = 17\%$) was no greater than the number of personal goals male participants recalled ($M = 72\%$, $SD = 13\%$), $t(72) = -0.912, p = .37$, Cohen's $d = -0.46$. If females simply have a greater capacity for remembering outstanding goals, we would expect them to also outperform their male counterparts in the personal goal condition. To the contrary, the gender difference in memory performance was specific to goals whose successful implementation would benefit others. When the participant was the only beneficiary of mnemonic work, men recalled as many of their goals as women.

Discussion

Study 3 and Study 2 converge on finding that women exert more effort to remember outstanding goals when others stand to benefit from their implementation than men. This gender difference in mnemonic performance emerged only when other people benefitted from successful recall and not when the goals were only personally beneficial (i.e., there were no beneficiaries beyond the person tasked with the goal's recall). We believe that this pattern of results is best explained by a motivational account and not because of a capacity difference: women expend more effort to attend and encode goals when there are other beneficiaries, presumably because they are socialized to be concerned with others' outstanding needs. By contrast, male participants' mnemonic performance is not at all affected by whether or not their remembering had consequences for others, perhaps because they face a lower societal imperative to be communal.

As an aggregate, results from Study 3 indicate the discrepancy in mental labor between genders can occur under minimal circumstances. Unlike in Studies 1a–1c and 2, wherein the dyads might carry a couple-specific, historically determined labor division, Study 3 suggests that no prior relationship between the members of a dyad is necessary for the effect to emerge.

To gain further insight into why men exhibit relatively poorer memory for communal goals than women, we strategically implemented the experimental manipulation at goal encoding, while keeping the incentive structure constant at goal retrieval. Doing so helped to isolate the effect of goal type (communal or personal) on encoding, and better positioned us to argue that these labor differences emerge early in the processing stream. The findings clearly support the claim that men exhibit less communality in their prospective remembering because they pay less attention to these goals in the first place. Of course this finding does not rule out the possibility that gender affects other stages of prospective remembering, such as rehearsal of the goal, monitoring the environment for retrieval cues, and so forth. Future research might examine this question directly.

General Discussion

The current studies examine a gender difference that has gone underappreciated: the tendency for women to do more of the “mnemonic work” necessary for others' needs to be met. Whereas past work has focused on gender differences in the *implementation* of labor done on behalf of a collective (e.g., the family unit; Bianchi et al., 2000; Casper & Bianchi, 2009; Fenstermaker, 1985; Hochschild, 1989; Hook, 2006; Kan et al., 2011; Pettit & Hook, 2009; Robinson & Godbey, 1997; Shelton & John, 1996), the present investigation asks whether women are more likely to take on the *mental work* that goes along with this labor. As we point out, successfully meeting a collective's need, such as getting a child's teeth cleaned, requires an array of mental activity: noticing the need exists, reminding oneself that the need is outstanding, tracking progress in meeting the need, dealing with any contingencies that must be met to fulfill the need, and recognizing when an opportunity to meet that need finally arrives. These activities often have costs (Smith, 2003), which to this point have been taken for granted outside the literature on prospective memory, perhaps because this labor is largely invisible.

The present investigation found support for these ideas across seven studies that use a range of samples and methodologies. Studies 1a–1d demonstrate there is a widespread assumption that women are more likely to remember outstanding goals for which others are beneficiaries. Results show that people assume women are inclined to perform this mental labor even for goals for which they are not responsible or that are presumed to be in the “men's work,” implying that this type of remembering may itself be gendered. Study 2 then validates this assumption with natural couples, showing that women in heterosexual relationships seem to maintain in memory a greater *number* of collective goals (i.e., activities for which there are other beneficiaries) than men, and that the prospective remembering undertaken by women yields greater *cumulative benefit* to others than that undertaken by men. In fact, Study 2 presents evidence that women are inclined to do disproportionate mnemonic labor even for goals whose implementation is not their responsibility. Study 3 builds on Study 2 findings with evidence that this gender difference in mne-

monic labor emerges in ad hoc couples, with evidence that the effect reflects heightened motivation on the part of women and not greater capacity for this form of remembering, and with evidence that the gender difference emerges at goal encoding, which suggests that men allocate less communal attention to the need in the first place.

To be clear, our intention is not to suggest that women are inherently better at doing this form of remembering—this paper is not about the accuracy of stereotypes (cf., Jussim, Crawford, & Rubinstein, 2015; Koenig & Eagly, 2014)—but about how the assumption that women do more mnemonic labor becomes an expectation that they do so. The central aim of this paper is to show that societal pressure around doing this form of labor exists, and to draw attention to the implications of doing a disproportionate amount of this type of mental work. If anything, the findings we obtained herein suggest the difference that exists in prospective remembering performance is rooted entirely in motivation and not in biology (Study 3; see also Hyde, 2005).

The present work builds on previous research that has observed gender disparities in the asymmetry in household labor (e.g., meal preparation or cooking, housecleaning, shopping for groceries or household goods, and doing laundry, see Shelton & John, 1996) and women's heavier burden of organizational citizenship behavior at work (e.g., Heilman & Chen, 2005; Lovell et al., 1999; Vigoda-Gadot, 2007). Like these gender disparities, the difference we observed in the present investigation may be rooted in intensified prescriptive stereotypes for women to prioritize the goals and needs of others and the groups to which they belong and men's relaxed prescriptions for doing so. To the extent that "we like what we do well" and we do well what we've practiced, women's higher likelihood of attuning to others' goals may be internalized as a personal value and self-prescription. Further, insufficient attunement to communal goals carries the threat of social sanction from family, friends, dependents, spouse, and perhaps even the self in the form of guilt. The evidence presented herein seems to suggest a key way in which a gender difference in communality might manifest is as a willingness to undertake mental labor to meet a greater collective's needs.

In addition to establishing the existence of this mnemonic labor difference, the present investigation gathered preliminary data that speak to its extensiveness. In particular, we assessed the extent to which these labor differences in communal remembering result because mental labor is bundled with physical labor (and women tend to be in charge of physical labor that is communal) or whether this remembering behavior is itself gendered. Preliminary findings suggest that this specific type of remembering tends to be gendered. Results clearly show that "bundling" cannot fully account for our pattern of findings: Women are assumed to be in charge of the mnemonic labor required to enact outstanding communal goals even when they're not explicitly in charge of the implementation of those goals (Study 2; see also Ahn et al., 2017).

A gendered account does not fully explain our pattern of results. Goals that involve activities that are highly male (e.g., changing the car's oil) were presumed to be the mnemonic burden of the male. Some degree of bundling is presumed to occur in the case of highly gendered activities. This may explain the related observations that goals for which women are responsible tend to be more communal than the ones for which men are responsible (see Table 4 in SOM). Although speculative, our findings suggest that a prospective memory for communal goals may arise from a circular process in which women maintain communal goals in memory and those then become women's work.

Of course, it may be worth speculating on the potential upsides of having this mental inclination. Though taking on more mnemonic work has its costs, there can be certain benefits. It could be that women may be especially good in leadership roles, as the large literature on emotional intelligence implies that being attuned to others predicts effective leadership (cf., Van Velsor, Taylor, & Leslie, 1993; Zaccaro, Gilbert, Thor, & Mumford, 1991). They would be particularly adept as democratic (vs. autocratic leaders). Democratic leadership style is marked by mutual respect that requires collaboration and coordination between leaders and subordinates, whereas autocratic leadership is characterized by dominant control over subordinates (see Bass, 1981; Eagly & Johnson, 1990). Thus, engaging in mnemonic labor, and effectively doing so, could support a democratic leadership because such leaders have high interpersonal

accuracy and sensitivity to the emotions of others and subordinates (Lord & Hall, 2005; see also meta-analysis Hall, Mast, & Latu, 2015), and would focus on mentoring their subordinates and paying attention to their individual needs—even helping and doing favors for subordinates and looking out for their welfare (Bass, 1981).

Potential benefits aside, undertaking labor of this particular variety has costs, and there are risks in doing a disproportionate amount of this type of work. Unresolved needs and goals appear to be a primary source of internal distraction (e.g., Klinger & Cox, 2011; Mason, Bar, & Macrae, 2009; Slepian, Chun, & Mason, 2017), perhaps because meeting them often requires self-reminding of their existence (Mason & Reinholtz, 2015). The extent to which this self-reminding interferes with daily activities is an open question, but it seems reasonable to suggest that it might. Just as implementing work carries opportunity costs (i.e., the forgone value of completing another goal), so too does recalling it: thinking about outstanding goals that benefit the collective costs resources that could otherwise be spent thinking about one's own needs and responsibilities. And, contrary to the argument that the mental support one must engage in to enact outstanding goals is trivial is evidence that forgetting an outstanding goal is the *most common* everyday memory failure. If it were easy to succeed at it, we would not fail so routinely.

The traditional gendered division of labor whereby women attend to home and children and men attend to work has not caught up with the changing ways women and men navigate their multiple goals and responsibilities (Diekmann, Eagly, & Johnston, 2010). Given that women constitute a large section of the workforce, managers have a vested interest in understanding and mitigating possible downstream consequences of this phenomenon from a human capital training perspective (Noe, 2016). Advocates who wish to increase participation by underrepresented groups in high-status fields (Hill, Corbett, & St Rose, 2010; Hurtado, Newman, Tran, & Chang, 2010) should be aware of mental labor as a hidden obstacle blocking the success of women in the world of work. Stereotypical expectations that women shoulder more of the mental and physical labor around collective goals may constitute a compounded threat

to women's productivity: women risk being mentally taxed by boosting the productivity of others. One might also expect there to be downstream consequences to becoming saddled with this mnemonic activity in the form of stress, or diminished life and relationship satisfaction, or burnout. To the extent that gender stereotypes operate as defaults, the perpetuation of gender disparities in prospective memory for communal goals is not likely to change unless it is challenged by widespread commitment to behavioral change.

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