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Word Order Denotes Relevance Differences: The Case of Conjoined Phrases With Lexical Gender

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This work explores the order of linguistic references to the two genders (e.g., *men and women* vs. *women and men*). It argues that a gender is more likely to be mentioned first when it is perceived to have higher relevance in a context rather than lower relevance, and audiences assign stronger relevance to a party when the party is mentioned first rather than second. Studies 1–3 document the current prevalence of male-first conjoined phrases in the public (but not family) domain and link the pattern to historical changes in women's public presence over the 20th century. Study 4 shows that contextual relevance cues affect the odds of first mention, such that people are more likely to refer to a woman before a man, when the two are in a primary school classroom rather than a corporate office. At the same time, Studies 4 and 5 find that people often choose to reproduce collectively preferred word order patterns (e.g., *men and women*). Studies 6 and 7 show that these choices matter because people assign more relevance to a party when it comes first rather than second in a conjoined phrase. Overall, this work offers theoretical grounding and empirical evidence for word order as a means of expressing and perpetuating gender stereotypes.

Keywords: gender, language, stereotypes

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When do people say "*women and men*" and when do they instead say "*men and women*"? And what does this choice communicate to audiences? This paper argues that word order choices are a function of the two genders' relative relevance in a context, and audiences, in turn, use them as relevance cues. If this is true, word order choices can be a means of conveying and reinforcing gender beliefs about the two genders' relevance in a given context such as work or family.

Communicating Gender Stereotypes Through Language

Stereotypes are generalized beliefs about members of a social category. Language plays a critical role in forming, disseminating, and maintaining stereotypes (Kashima, Fiedler, & Freytag, 2008; Maass & Arcuri, 1996; Van Dijk, 1987; Wigboldus & Douglas, 2007). Sometimes stereotypes are transmitted blatantly via language, such as through racist or sexist language, derogatory labels, or jokes featuring certain groups (Carnaghi & Maass, 2007; Simon & Greenberg, 1996). Stereotypes can also be transmitted subtly and covertly. For example, people tend to describe positive actions of their ingroup members with personality adjectives ("*she is charitable*"), and their negative actions with concrete action verbs ("*she yelled at the driver*"). This pattern is reversed for outgroup members, such that people describe outgroup members' positive actions with concrete action verbs that isolate them as solo incidents ("*she donated to a charity*") and their negative actions with personality adjectives that imply global and stable qualities ("*she is aggressive*"; Maass, Salvi, Arcuri, & Semin, 1989; Maass, 1999). This tendency, called the *Linguistic Intergroup Bias*, illustrates how stereotypes can be transmitted with elusive subtlety.

The possibilities for linguistic transmission are particularly abundant for gender stereotypes. This is because gender is a fundamental category organizing social perceptions (Fiske, Haslam, & Fiske, 1991; Stangor, Lynch, Duan, & Glass, 1992; van Knippenberg, van Twuyver, & Pepels, 1994), and therefore, more richly represented in language than any other social category. One means of representing gender in language is through *lexical gender*. Lexical gender refers to a term's semantic property of denoting a female or male. Basic kinship terms of any language are lexically gendered (e.g., *uncle*, *aunt*; Hellinger & Bußmann, 2001), and lexical gender can extend to personal pronouns (*she*, *he*), social titles (*duchess*, *duke*), and occupations (*actor*, *actress*). Usage patterns of lexical gender provide a window into a language community's gender relations and gender beliefs (Weatherall, 2002). For example, the appearance frequency of female pronouns (e.g., *she*, *her*) relative to male pronouns (e.g., *he*, *him*) in American books has been shown to track the public status of women in the U.S. (Twenge, Campbell, & Gentile, 2012).

Lexical gender adds possibilities to the expression and transmission of gender beliefs that are not available for social categories lacking this extra linguistic marking. Scholars have identified various uses of lexical gender as expressions of gender stereotypes. *Masculine generics*, for example, refer to masculine forms that are used when gender is irrelevant, unspecified, or unknown (Silveira, 1980). Examples include words such as "*mankind*," occupational

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titles such as "*congressman*" and "*policeman*," and masculine pronouns used to refer to a generic person (e.g., "*a good doctor listens to his patients*"). Another means of conveying gender beliefs through lexical gender is specifying gender only when gender expectations are violated (Romaine, 2000; Stahlberg, Braun, Irmen, & Sczesny, 2007). Phrases such as "*woman surgeon,*" "*lady judge*," and "*male nurse*" are sometimes heard when the gender of the surgeon, judge, and nurse would have gone unstated, had they matched expectations. In the same vein, certain lexical gaps point to gender expectations: "*Career woman*," "*working mother*," and "*family man*" are part of English phraseology, when their opposite-gender equivalents, "*career man*," "*working father*," and "*family woman*" are not.

A body of evidence demonstrates that such uses of lexical gender not only express gender beliefs, but also shape the way people perceive social reality (for a comprehensive review see Stahlberg et al., 2007). Masculine generics, for example, have consistently been shown to evoke mental images of men rather than women, even if they are accompanied with explicit statements that the reference includes both genders (e.g., Gastil, 1990; Hamilton, 1988; Hyde, 1984; Moulton, Robinson, & Elias, 1978). These mental images have consequences: In more than one study, women expressed less interest and inclination to pursue a job when it was described in the masculine generic as opposed to gender-neutral language (Bem & Bem, 1973; Briere & Lanktree, 1983; Stout & Dasgupta, 2011). One potential explanation for this is that women think a job described in the masculine generic is harder to get for a woman than a job described in gender-neutral language (Stericker, 1981). Another potential explanation is that the masculine generic heightens the amount of ostracism women anticipate at a job and reduces their sense of identification and belonging with it (Stout & Dasgupta, 2011; cf. Gaucher, Friesen, & Kay, 2011). This missing sense of identification would also explain why female college students recalled less about an essay titled "*The Psychologist and His Work*," compared with male students, and compared with other female students who read a gender-inclusive version of the same essay titled "*The Psychologist and His or Her Work*" (Crawford & English, 1984). Altogether, these findings converge on the conclusion that the use of lexical gender affects the way people construct social reality and their place in it as a woman or a man.

This paper studies one aspect of lexical gender use that did not receive much attention from scholars or advocates of gender-neutral language. When the second-wave women's movement targeted the masculine generic as gender-biased language, a popular demand was replacing the generic "*he*" with "*he or she*." This solution ensured the symbolic inclusion of females in the references. And yet, by putting the male before the female, "*he or she*" was perhaps only a partial solution that fell short of full gender-neutrality. The current work addresses the reasons for putting one gender before the other and the consequences of such a choice.

Brown (1986, p. 484) has been credited with being the first psychologist to point out to word order in conjoined phrases as an instance of gender-biased language, and some seminal work has been done in this area (Hegarty, Watson, Fletcher, & McQueen, 2011; Wright & Hay, 2002; Wright, Hay, & Bent, 2005). Before reviewing this work and proposing a theoretical account to explain word order effects, I will first situate the question of word order within the broader context of configurational choices in symbolic constructions.

Configurational Choices in Symbolic Constructions

Symbolic creators arrange symbols in time or space. They need to choose whether something will go left or right, up or down, first or second. These configurational choices are partially constrained, such as when word order in a sentence has to abide by syntactic rules, and the arrangement of objects in a realistic painting by the law of gravity. Even though creators are free to choose any arrangement within these constraints, research finds that they tend to produce certain configurational patterns more often than others.

One such regularity concerns the horizontal positioning of social categories in pictorial representations. Speakers of languages written from left to right tend to depict members of more agentic groups to the left of less agentic groups' members (Maass, Suitner, Favaretto, & Cignacchi, 2009; Suitner & Maass, 2007). For example, Western paintings and cartoons often present men to the left of women, but only when the man is considered more agentic than the woman. The direction of this *Spatial Agency Bias* reverses for those reading and writing from right to left: While Italian speakers were more likely to draw males to the left of females if they associated males with greater agency, Arabic speakers exhibited the opposite tendency (Maass et al., 2009). Similarly, readers of left-to-right scripts draw agents to the left of the patients of action (Chatterjee, Southwood, & Basilico, 1999).

Systematic differences in women and men's spatial positioning are not limited to artistic representations. An analysis of articles published in four prominent psychology journals between 1965 and 2004 found that 74% of the graphs and tables presented men's data to the left or above women's data (Hegarty & Buechel, 2006). However, this male-first pattern disappeared when fathers and mothers were being represented. Hegarty and colleagues also showed that people spontaneously graph men's data before women's, and suggested that power is the main factor driving this effect, as opposed to other potential explanations such as typicality or masculinity (Hegarty, Lemieux, & McQueen, 2010).

Unlike visual representations, linguistic configurations are sequentially ordered in time and the cognitive processes underlying linguistic configurations are not necessarily the same ones underlying spatial configurations (Hegarty & Lemieux, 2011). Nevertheless, similar factors have been proposed to account for regularities in both types of configurations. The primacy of agency, in particular, does resurface in linguistic constructions. At the sentence level, the subject precedes the object in the vast majority of the world's languages, with fewer than 4% of languages departing from this pattern (Dryer, 2013; Song, 2001). The most common word order patterns are Subject-Verb-Object and Subject-Object-Verb, accounting for about 76% of languages (Dryer, 2013). In contrast, object-initial languages are so rare that linguists did not become aware of their existence until the 1980s. Agency is thus typically accorded primacy across the world's languages.

Further down the linguistic hierarchy is the phrase level—the primary interest of this paper. Phrases conjoined by a coordination (*and*, *or*), such as *mother and father*, offer a particularly suitable context for studying the question of word order. Because the constituents of a conjoined phrase are in the same grammatical

role, we can study word order in the absence of any confounding semantic features that are tied to different grammatical roles.

Explaining Word Order in Conjoined Phrases

Social psychologists did not pay much attention to the question of word order in conjoined phrases. The two exceptions are seminal but scantly noted work by McGuire and McGuire (1992) and work by Hegarty and colleagues reviewed below. Linguists and psycholinguists, in contrast, have extensively studied word order in conjoined phrases.

Linguistic research has investigated word properties that are associated with initial position in conjoined phrases and linked it to multiple word attributes concerning phonology, use frequency, and semantics (for reviews, see Lohmann, 2014; Mollin, 2012). Although our focus is on semantic factors, we want to keep in mind that multiple interrelated factors are at play. For example, words with one syllable are more likely to appear in the first position in a conjoined phrase (e.g., *salt and pepper*; Bolinger, 1962; Pinker & Birdsong, 1979), as are more frequent words (e.g., *ball and chain*; Benor & Levy, 2006; Fenk-Oczlon, 1989; Wright et al., 2005).

Some of the semantic factors that linguists have linked to word order are pertinent to social categories including gender: The more powerful of a word pair is more likely to be mentioned first (e.g., *rich and poor*, *king and queen*; Benor & Levy, 2006). Similarly, "priorities inherent in the structure of a society" (Malkiel, 1959, p. 145), importance and salience (Landsberg, 1995), and social status (Allan, 1987; McGuire & McGuire, 1992) have been linked to word order. Agency, again, is on the list: Corpora analyses and experiments have shown a tendency for more agentic and animate entities to be placed before less agentic and inanimate entities (e.g., "*living and dead*," "*people and things*"; Benor & Levy, 2006; McDonald, Bock, & Kelly, 1993).

These attributes are often associated with masculinity, and studies that specifically investigate gender as a semantic category have documented a prevalence of male primacy. Hegarty and his colleagues examined word order in conjoined phrases with female and male proper nouns. Searching the Internet for common female and male name combinations (e.g., "*Emily and Jack*"), they showed male names to come before female names more often than the reverse (Hegarty et al., 2011; also see Wright & Hay, 2002). This pattern held even after controlling for some phonological factors associated with word order (cf. Wright et al., 2005). Hegarty and colleagues also found that the first-mentioned member of a same-sex couple is attributed more stereotypically masculine traits (e.g., earning more, being physically stronger) than the second-mentioned member (Hegarty et al., 2011).

A second stream of research on word order takes a psycholinguistic approach and focuses on the cognitive processes involved in language production that give rise to the regularities identified by linguists. From this perspective, language is produced by mentally accessing and sequencing linguistic units. Psycholinguists have proposed that the sequence of the units depends among others on the relative ease with which they are retrieved from memory, or their *accessibility* (Bock, 1982; Bock & Warren, 1985; McDonald et al., 1993). More accessible concepts are more likely to be retrieved before less accessible ones, and therefore more likely to be mentioned before them.

This begs the question of what renders a concept semantically more accessible than another. I will next review the factors that increase accessibility and argue that these factors capture the centrality of that concept in a context, or its *relevance*.

Relevance as a Predictor of Word Order

Relevance is defined here as the quality of being connected, central, and important to the matter at hand. This section will argue that relevance cognitively manifests itself as stronger cognitive accessibility: When communicators perceive a concept to be more relevant, it will be more accessible to them, and they will thus be more likely to mention it first. To build this argument, I will survey the predictors of accessibility and describe how they are characteristic of relevant concepts more than of irrelevant ones.

The first predictor of accessibility is frequency and recency of use (Srull & Wyer, 1979). Concepts become more accessible if they are used frequently and were used recently. People would refer more often to something that is connected, central, or important to the matter at hand, than something that is not. For example, because men tend to play more central roles in politics, people hear more political references to men than to women, and the recent references they heard likely mirror this pattern.

A second predictor of accessibility is the activation of related concepts within a semantic network (Higgins, 1996). Because a gender that is more central or connected to a domain would have stronger semantic assocations with that domain, that gender would gain stronger accessibility within the context of that domain. For example, fashion is more strongly associated with women than with men. Consequently, women will likely be more accessible when producing a phrase concerning fashion (e.g., "*best-dressed actresses and actors on the red carpet*").

A third predictor of accessibility is the communicator's attentional focus. A concept that is more prominent or conspicuous to a communicator will be top-of-mind and thus more easily retrieved than a less conspicuous one (Taylor & Fiske, 1978). Because the gender that is more central or important to a matter at hand will attract more attention and will be more conspicuous, the more relevant gender in a particular context is expected to gain stronger accessibility.

In sum, each cognitive predictor of accessibility more aptly characterizes the more relevant gender in a context than the less relevant gender: The gender that is more relevant and central in a context would be encountered more frequently in that context, it would have stronger semantic associations with that context, and it would draw more attention in that context. In light of research linking accessibility to first mention then (e.g., Bock & Warren, 1985; McDonald et al., 1993), that gender would be more likely to be mentioned first in that context, everything else being the same.

This relevance account can explain why powerful, high-status, and agentic parties often populate primary positions: It is because they are typically more central and important (i.e., more relevant) than their powerless, low-status, and passive counterparts. They are important players because to predict and control their lives, people need to be attuned to changes in their environment. Agency, power, and status drive such change and are thus major contenders for attention. Power and agency afford the ability to control others' outcomes and people attend more closely to powerful others (S. T. Fiske, 1993). High-status people often have

greater agency and power than low-status people, and in any case people attribute greater agency to those with higher status (Conway, Pizzamiglio, & Mount, 1996). Agentic, powerful, and high-status parties are thus more likely to be attended to, and therefore more accessible and more likely to be mentioned first.

Importantly, however, the proposed account also predicts when people will be less likely to put agency, status, and power first. If relevance is indeed the principal factor, the less agentic, powerless, and low-status parties should be more likely to be mentioned first when they command stronger relevance in a communicational context. This prediction holds up to intuition. Let us consider the sentences "*The patient and her caregiver visited the doctor*" or "*The child and her mother are in protective custody for safety reasons.*" Even though the child and the patient are unlikely to be more agentic, more powerful, or higher in status than their company in these sentences, their ordering does not strike us as peculiar, presumably because it's easy to imagine them being of central interest in these contexts.

Word Order as a Predictor of Perceived Relevance

The argument so far was that relevance increases the odds of first mention because relevant concepts become cognitively accessible and more accessible concepts are more likely to be mentioned first. Shifting our focus from the production of conjoined phrases to their comprehension, the next question is whether word order has a corresponding effect on audiences such that they attribute stronger relevance to a party when it is mentioned first rather than second. Research on language comprehension suggests that they would.

Language comprehension involves building a mental model of the state of affairs described with words (Johnson-Laird, 1983; Zwaan & Radvansky, 1998). When audiences build these mental models, they use the first element of a phrase or sentence as their starting point (MacWhinney, 1977). With the initial words, they lay the foundation of the mental structure to which they attach and accommodate subsequent information (Gernsbacher, Hargreaves, & Beeman, 1989). Supporting this model of foundation building, initial linguistic positions receive more extended processing (for a review, see Gernsbacher & Hargreaves, 1992). People take longer to decide whether a word starts with the letter *b* if it occurs earlier in a sentence rather than later, presumably because early in the sentence they are devoting their processing resources to building a foundation, which leaves them with few resources for phonetic processing (Foss, 1969). People also have faster access to the first mentioned party in a sentence or conjoined phrase than the second-mentioned (Carreiras, Gernsbacher, & Villa, 1995; Gernsbacher & Hargreaves, 1988).

When a party appears in the first position then, rather than the second, it becomes more central in the mental model constructed, is processed more deeply, and becomes more accessible. As these features all characterize relevance as we have defined it, a party should appear more relevant to audiences when it is mentioned first in a conjoined phrase rather than second. Some indirect evidence already links initial positions with perceived centrality: People attribute a stronger causal role to a party if it is presented early in a sentence rather than later (Bettinsoli, Maass, Kashima, & Suitner, 2015). And second-language learners tend to assign to the first noun in a sentence the grammatical role of subject or the semantic role of agent, whether this is true or not (VanPatten, 2004, 2007).

Hypotheses

I argued that relevance is one factor that determines which party will be mentioned first such that, everything else being equal, people are expected to refer to the more relevant party before the less relevant party. It follows that the gender of the first-mentioned party will be a function of the relative relevance of the two genders in a given context. It is thus hypothesized:

> *Hypothesis 1:* The odds of first mention increase for the gender that is (or is presumed to be) the more central player in a context.

Men on average play more central roles in public life than women do (Catalyst, 2013; Inter-Parliamentary Union, 2014). Women, on the other hand, tend to play more central roles in household management, raising children and caregiving (Coltrane & Adams, 2008). Gender stereotypes track this allocation of social roles (Eagly & Steffen, 1984): Women, more than men, are associated with family roles (Park, Smith, & Correll, 2010), and men, more than women, are associated with public roles such as leader and manager (Koenig, Eagly, Mitchell, & Ristikari, 2011).

In view of these relevance differences across domains, Hypothesis 1 predicts that women would be mentioned before men more often in a family context than they would be outside the family context. This prediction will be tested in large linguistic corpora such as digital book repositories and newspaper archives. If the hypothesis is correct, these corpora should contain a smaller proportion of conjoined phrases that start with the male party when the constituent words belong to the kinship domain (e.g., *mother/father*), as opposed to the nonkinship domain (e.g., *congressman/congresswoman*). Moreover, these proportions should fluctuate with sociohistorical changes in gender roles.

Even though Hypothesis 1 says that the odds of being mentioned first are higher for the more relevant party by virtue of its stronger accessibility, people do not always construct phrases by accessing individual words. The full phrase may also be accessed as a lexical unit, especially when it is used frequently (Janssen & Barber, 2012). For example, the salutation "*ladies and gentlemen*" is so much more common than "*gentlemen and ladies*," that it is considered "frozen" by linguists (Mollin, 2012). When a conjoined phrase is more common than its reverse, it would also be more accessible as a unit. It is thus hypothesized:

> *Hypothesis 2:* Everything else being equal, people will tend to reproduce the collectively preferred word order patterns.

To the extent that the collectively preferred word order patterns are also the stereotype-consistent ones, as predicted by Hypothesis 1, this dynamic would lead people to reproduce phrases in which the gender that is stereotypically associated with a context is mentioned first. A news reporter may write "*the congressman and congresswoman introduced a bill*," without any presumption that the congressman was more central to the process than the congresswoman. A kindergarten teacher may say "*mothers and fathers should read to their children,*" without any presumption that the appeal is more relevant to mothers than fathers. We would like to

know how hearing these stereotype-consistent word orders, as opposed to their inverse, affects audiences' understanding of social reality. It was argued that a first position grants its occupant a more central place in the mental models audiences build than a secondary position. Accordingly, it is hypothesized:

> *Hypothesis 3:* Audiences will attribute stronger relevance to a gender if that gender is mentioned first rather than second in a conjoined phrase.

Please note that the hypothesis focuses on how people attribute differential relevance to the same party when it is in the first versus second position. It does not make any claims on how people attribute relevance to the party in the first position versus the party in the second position. Two parties in a conjoined phrase differ not only in their positions but also in the background assumptions people have about their relevance in a given context. A presupposition of the second party's stronger relevance may sometimes override the relevance premium bestowed by the initial position, such that people will assign more relevance to the party appearing in the second position than the one in the first position. The claim is that this party would have been assigned even more relevance, had it been placed first.

The Current Studies

These hypotheses were tested in seven studies. The first three are archival studies documenting collective order patterns of gendered words in English, as captured in news sources (Study 1), scholarly journals (Study 2), and books (Study 3). These studies test Hypothesis 1 by tracking order patterns for family versus public domains, and their change over time. Study 4 simultaneously tests Hypotheses 1 and 2 by asking participants to describe a woman and a man seen in a stereotypically male context (office) or a stereotypically female context (primary school classroom). Study 5 tests Hypothesis 3 by inviting participants to form conjoined phrases with a given pair of words. Finally, Studies 6 and 7 test Hypothesis 3 by investigating how word order affects attributions of relevance to the two genders in a context.[1]

Study 1

Factiva is a database of media outlets specializing in business and politics. At the time of data collection, the database offered more than 35,000 sources from more than 200 countries. Although the earliest document in the database dates 1951, the collection is heavily skewed toward the present. Less than 1% of available content was dated before 1985 at the time of retrieval, and approximately 80% was dated 2000 or later. The database thus captures written news media in English around the beginning of the 21st century.

Method

The database was searched for 18 word pairs conjoined by "*and*." The word pairs belonged to one of two categories: (a) nonkinship terms in singular and plural forms (*woman/man*, *women/men*, *girl/boy*, *girls/boys*, *businesswoman/businessman*, *businesswomen/businessmen*, *congresswoman/congressman*, *congresswomen/congressmen*, *chairwoman/chairman*, *chairwomen/chairmen*, *spokeswoman/spokesman*, *spokeswomen/spokesmen*); and (b) kinship terms in singular form (*mother/father*, *grandmother/grandfather*, *aunt/uncle*, *daughter/son*, *sister/brother*, *niece/nephew*). The plural forms were omitted for kinship terms because of their low frequencies in the corpus.

The searches covered all available dates at the time of the search. A research assistant recorded the number of hits for the two phrases with each word pair. The search was not case-sensitive. Factiva offers separate search results for publications, web news, blogs, pictures, and multimedia. Only the results for publications will be reported here because of the low frequencies obtained for the other categories.

Results and Discussion

The ratio of male-first phrases for a word pair was calculated as the frequency of male-first phrases divided by the total frequency of all conjoined phrases with that word pair. For example, the male-first ratio for the *woman/man* word pair is given by the formula:

$$\text{male-first ratio}_{(woman,\ man)} = \frac{\text{N}(\text{“}man\ \ and\ \ woman\text{”})}{\text{N}(\text{“}man\ \ and\ \ woman\text{”}) + \text{N}(\text{“}woman\ \ and\ \ man\text{”})}$$

A gender-neutral pattern thus corresponds to a ratio of 50%, with higher ratios indicating a male-first pattern and lower ratios a female-first pattern.

Table 1 presents the number of total hits for each word pair and their male-first ratios. The number of recorded phrases for each word pair range between 53 (*spokesman/spokeswoman*) and 1,681,495 (*men/women*), with a median of 12,119 phrases.

For nonkinship words, the male-first ratios range between 79.9% ("*boy and girl*") and 99.0% ("*spokesmen and spokeswomen*"). The average male-first ratio for the 12 nonkinship word pairs is 89.5% ($SD = 7.7\%$), which is significantly different from a 50% gender-neutral pattern; $t(11) = 17.85$, $p < .0001$. The ratios are also significantly different from 50% for each of the word pairs individually (all χ^2s > 26.89, ps < 0.0001).

For kinship words, male-first ratios range between 19.1% ("*nephew and niece*") and 79.6% ("*brother and sister*"). The average ratio is 43.0% ($SD = 25.6\%$), which does not significantly differ from 50%; $t(5) = 0.67$, *ns*. Again, for each word pair, the ratio significantly differs from an even split; χ^2s > 48.57, ps < 0.0001. Whereas *brother/sister* and *son/daughter* show a male-first pattern, *grandmother/grandfather*, *mother/father*, *aunt/uncle*, and *niece/nephew* show a female-first pattern.

Supporting Hypothesis 1, the distributions for kinship and nonkinship words are significantly different from each other, with nonkinship word pairs exhibiting stronger male primacy than nonkinship words; $t(5.455) = 4.36$, $p = .006$.

To test for potential differences in more influential outlets, seven high-profile newspapers and magazines were analyzed separately (*The New York Times*, *The Washington Post*, *Financial Times*, *The Wall Street Journal*, *Newsweek*, *Forbes*, *New Yorker*). This subset closely mirrors the full set, $r(17) = 0.97$, $p < .0001$,

[1] All data analyzed for this paper are available online at https://osf.io/qbz8m

Table 1
Ratio of Male-First Conjoined Phrases—Factiva Search of News Media (Study 1)

Word pair	All publications		High-profile publications	
	% Ratio	*N* of hits	% Ratio	*N* of hits
Non-kinship terms				
spokesmen/spokeswomen	99.0	207	94.7	19
congressmen/congresswomen	98.5	589	100.0	9
chairmen/chairwomen	96.9	773	95.0	40
businessmen/businesswomen	96.6	1,628	98.4	61
man/woman	95.8	130,912	95.8	4,469
men/women[a]	90.9	1,681,495	93.3	61,609
spokesman/spokeswoman	88.7	53	(100.0)	2
boys/girls[a]	83.4	412,230	85.9	10,817
chairman/chairwoman	82.2	725	71.4	35
businessman/businesswoman	81.4	167	(100.0)	2
congressman/congresswoman	80.6	72	(100.0)	1
Boy/girl	79.9	38,115	80.8	1,068
Kinship terms				
brother/sister[a]	79.6	145,044	76.7	5,185
son/daughter[a]	67.4	122,212	71.7	3,950
grandfather/grandmother[a]	44.5	3,950	35.6	146
mother/father[a]	26.3	133,977	27.5	5,716
uncle/aunt	21.2	32,208	20.0	1,252
nephew/niece	19.1	12,119	15.5	328

Note. Ratios are significantly different from a 50% even split unless presented in parentheses. Word pairs are listed in declining order of male-first ratios in the full set of publications.
[a] Indicates a significantly different ratio across the full set and high-profile publications.

with no systematic differences between the two sets. In this high-profile set as well, the male-first ratio for kinship words significantly differs from the ratio for nonkinship words; $t(5.593) = 4.65$, $p = .004$.

Study 2

In a corpus of scholarly articles, Study 2 tests two predictions derived from Hypothesis 1—that conjoined phrases would start more often with the male party if they belong to the kinship domain, and that their collective patterns would reflect sociohistorical changes in gender roles.

To test for the effect of sociohistorical changes, searches were conducted separately for the two consecutive 40-year periods of 1931–1970 and 1971–2010. The cut-off point between the two periods approximates a pivotal time in women's history. The second-wave of the feminist movement started in the early 1960s and its effects started to be felt at the end of the decade. By that time, women were attaining higher educational credentials and becoming more active participants in the organized economy (Eagly & Carli, 2007). For example, there is a sharp increase in the percentage of Ph.Ds, MDs, and law degrees granted to women after 1970 (Twenge et al., 2012, Figure 1). Given these changes in women's centrality to public life, conjoined phrases with nonkinship word pairs are expected to start with the male party less often after 1970.

Method

Searches were conducted in the scholarly article database *JSTOR*. At the time of the search JSTOR covered about 1,600 titles, with a large selection from the social sciences and humanities, along with a smaller selection from the natural sciences. JSTOR organizes its titles into topical subdivisions, numbering 57 at the time of the search. Some of these 57 topics are subsets of other topics. For example, titles covered under *African American Studies* are a subset of titles covered under *American Studies*.

Searches were limited to articles published in English during the two periods of interest (1931–1970 and 1971–2010). A research assistant searched for conjoined phrases with the word pairs *woman/man*, *women/men*, *girl/boy*, *girls/boys*, *female/male*, and *father/*

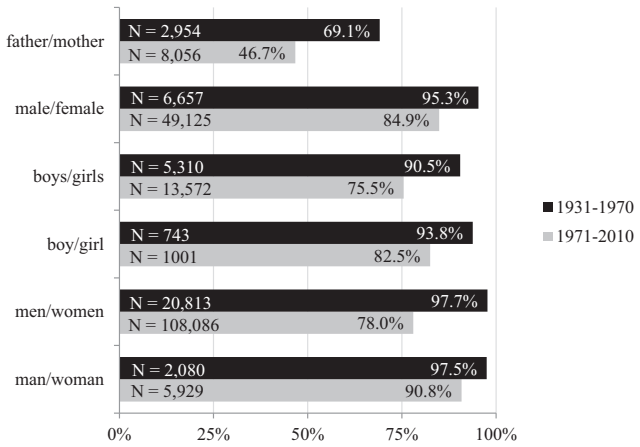

Figure 1. Ratios of male-first phrases in a scholarly database (*JSTOR*) across two 40-year periods. *N* denotes the total number of conjoined phrases with each word pair, combined across topics. The percentages represent the ratio of conjoined phrases starting with the male party.

mother, joined by the coordination *and*. The search was not case-sensitive.

Results and Discussion

Topics were dropped from analyses if they had fewer than 20 total hits across all word pairs.[2] Because the number of hits for particular word pairs within a single topic was often too small to obtain reliable ratios, the hits for different nonkinship word pairs were combined, and a single male-first ratio was calculated for all nonkinship words. Consequently, the presented ratios overweight patterns for more common word pairs such as *men/women* and *male/female*. Figure 1 presents the number of hits and ratios for different words pairs collapsed across topics, and Table 2 presents the topic-by-topic ratios.

Nonkinship word pairs. For the 1931–1970 period, the ratio of male-first phrases for nonkinship word pairs averages 95.6% across topics ($N = 42$, $SD = 2.8\%$). The ratios range between 87.7% (*Architecture & Architectural History*) and 100% (*Law, Public Policy & Administration*). In the subsequent period, the total ratio drops by 13.0%, to 82.6% ($N = 46$, $SD = 6.0\%$).

Supporting Hypothesis 1, a paired-sample *t* test by topic shows that the drop from the first period to the second is statistically significant; $t(41) = 14.11$, $p < .0001$. Conjoined phrases with nonkinship words were thus less likely to start with the male party after women became more central players in public life.

Despite this drop, male-first phrases are very common even in the latter period: The lowest ratio during this period is 59.7% for *Feminist and Women's Studies*—a ratio that is still significantly different from 50% ($\chi^2 = 186.76$, $p < .0001$). *Linguistics* comes a distant second with a ratio of 74.2%, and *Psychology* places 7th out of 46 fields with a ratio of 76.8%.

The father/mother word pair. For the *father/mother* word pair, the male-first ratio in the early period averages 71.5% across topics ($SD = 22.7\%$). In the subsequent 40 year-period, this ratio drops by 21.8% to 49.7% ($SD = 17.5\%$). This is a large unhypothesized drop; paired-samples-$t(41) = 6.99$, $p < .0001$.

Supporting Hypothesis 1, the ratio for nonkinships terms across topics is significantly higher than the ratio for kinship terms, both for the early period [paired-$t(41) = 7.08$, $p < .0001$]; and the latter period [paired-$t(44) = 14.23$, $p < .0001$].

Overall, Study 2 supports the hypothesized role of relevance in collective word order patterns by documenting the predicted effect for historical period, and showing that phrases with nonkinship words were more likely to start with the male party than phrases with a kinship word pair.

Study 3

Study 3 tested the two predictions derived from Hypothesis 1 in the more extensive database of *Google N-gram Viewer* (http://books.google.com/ngrams), with the additional conjunction word "*or*" and greater temporal resolution.

Google N-gram Viewer displays the appearance frequency of n-grams in a large corpus of books digitized by Google, as a percentage of all n-grams in the corpus for that year. For example, the search for "*she and he*" (a 3-gram) returns the appearance frequency of the phrase as a percentage of all 3-grams for a given year. The books in the corpus are mostly obtained from libraries and the sample thus overrepresents the kinds of books libraries acquire.

Method

The searches were done in the English 2012 corpus file which includes both fiction and nonfiction books in English. The search period started in 1901 and ended in 2000 because after 2000 there have been changes to the sampling of books which could affect the interpretation of results (Michel et al., 2011).

Searches were conducted for the nonkinship word pairs *she/he*, *woman/man*, *women/men*, *girl/boy*, and *girls/boys*; and for the kinship word pairs *mother/father*, *grandmother/grandfather*, *aunt/uncle*, *daughter/son*, *sister/brother*, and *niece/nephew*, conjoined with the conjunctions "*and*" and "*or*."

As the N-gram Viewer search is case-sensitive, searches covered spelling variations. For example, the frequency ratio for the phrase "*he or she*" is the summed frequency of three different spellings ("*he or she*," "*He or she*," and "*He or She*") divided by the total frequency of 3-grams.

Results and Discussion

The ratio of male-first phrases was again computed as a percentage of all phrases with that word pair. Figures 2 and 3 depict ratios for nonkinship and kinship word pairs conjoined by "*and*," and Table 3 presents full numerical results.[3]

Nonkinship word pairs. Across the 20th century, conjoined phrases with nonkinship words were far more likely to start with the male word ($M = 91.7\%$, $SD = 5.8\%$), and the century average for each word pair significantly differs from an even split; $ts(100) > 66.85$; $ps < 0.0001$. This male-first pattern is strongest for "*he or she*" (97.5%) and "*man and woman*" (97.5%), and weakest for "*he and she*" (79.8%).

For each word pair, correlation coefficients with time were computed separately for the period before and after 1970, to test for a divergence in patterns. For the 1900–1970 period, half of the correlations between male-first ratios and year does not significantly differ from 0, and neither does the average correlation across word pairs[4] ($M = -0.09$); $t(9) = 0.79$, *ns*. This finding suggests that between 1900 and 1970, the pattern for nonkinship words did not systematically change with time. After 1970, correlations for all nonkinship word pairs are significantly negative, indicating patterns of decline (all $ps < 0.0001$), and the average correlation is -0.93. Supporting Hypothesis 1, average correlation coefficients for the two periods significantly differ from each other; $t(18) = 8.84$, $p < .0001$.

Kinship word pairs. The average ratio of male-first phrases throughout the century for kinships word pairs is 74.2% ($SD =$

[2] Dropping topics with fewer than 20 total hits eliminated 11 topics for both time periods (*Aquatic Sciences*, *Astronomy*, *Botany & Plant Sciences*, *Developmental & Cell Biology*, *Film Studies*, *General Science*, *Irish Studies*, *Library Science*, *Palaeontology*, *Transportation Studies*, and *Zoology*), and 4 topics for only the earlier period (*Development Studies*, *Feminist and Women's Studies*, *Health Sciences,* and *Music*).

[3] Figures for phrases conjoined by "*or*" are available in the supplementary materials.

[4] Because the sampling distribution of Pearson's *r* is not normal, all average correlations are obtained by transforming correlations into Fisher's z-scores, averaging them, and then back-transforming the value (Silver & Dunlap, 1987).

Table 2
Ratio of Male-First Conjoined Phrases—JSTOR Search of Scholarly Journals (Study 2)

		Non-kinship word pairs				Kinship word pair: *mother/father*			
		1931–1970		1971–2010		1931–1970		1971–2010	
Topic	*N* of titles	% Ratio	*N* of hits	% Ratio	*N* of hits	% Ratio	*N* of hits	% Ratio	*N* of hits
African American studies	19	96.4	1,062	85.0	3,018	(60.3)	58	32.2	276
African studies	55	95.1	894	78.5	5,348	74.8	103	(55.4)	193
American Indian studies	8	88.9	54	82.5	406	(66.7)	15	(48.9)	47
American studies	125	96.8	1,443	83.6	5,634	74.3	167	(51.0)	310
Anthropology	93	94.5	2,267	80.0	8,411	67.7	430	42.7	576
Archaeology	94	93.0	596	85.3	1,466	73.2	56	74.3	74
Architecture & architectural history	33	87.7	57	86.4	206	(50.0)	4	(58.3)	12
Art & art history	195	94.9	487	87.6	1,423	69.6	46	63.2	68
Asian studies	73	95.9	788	83.7	6,527	83.3	120	61.9	373
Bibliography	22	98.4	187	88.7	567	67.7	31	(58.2)	55
Biological sciences	240	93.5	292	83.2	2,252	—	0	7.1	14
British studies	17	97.6	42	90.7	560	87.5	8	75.0	24
Business	235	97.2	2,399	81.5	16,604	76.9	52	37.1	404
Classical studies	58	95.0	932	87.9	1,748	80.4	97	64.6	178
Development studies	15	—	14	80.9	551	—	0	(45.0)	20
Ecology & evolutionary biology	75	93.5	292	83.2	2,231	—	0	7.1	14
Economics	173	97.0	2,969	81.8	15,532	69.9	83	38.6	435
Education	141	96.9	2,066	80.7	2,540	(61.2)	67	36.8	114
Feminist & women's studies	30	—	0	59.7	4,976	—	0	34.1	123
Finance	31	97.6	255	87.0	462	(66.7)	3	(66.7)	6
Folklore	27	92.9	283	82.5	401	68.9	74	(47.8)	23
Geography	33	97.7	310	76.6	900	100.0	8	(36.0)	25
Health policy	24	96.9	739	75.1	6,273	(39.3)	28	32.6	138
Health sciences	36	—	0	84.4	32	—	0	—	0
History of science & technology	42	97.5	197	82.2	1,009	87.2	39	(54.4)	57
History	334	96.9	2,674	84.6	18,123	81.9	232	60.3	854
Jewish studies	27	92.9	28	100.0	18	(100.0)	2	(100.0)	3
Language & literature	294	96.1	1,629	85.2	7,309	74.2	267	55.9	694
Latin American studies	54	99.3	143	77.6	1,690	100.0	4	(57.1)	63
Law	97	100.0	68	83.4	193	(100.0)	2	(50.0)	4
Linguistics	41	89.5	86	74.2	698	79.2	24	(54.3)	92
Management & organizational behavior	31	98.7	226	79.5	3,105	(100.0)	3	(48.3)	58
Marketing & advertising	14	94.4	195	87.9	904	(100.0)	1	(30.4)	23
Mathematics	72	93.7	205	84.4	346	100.0	4	(50.0)	14
Middle east studies	55	92.8	348	85.6	2,081	77.3	88	63.9	158
Music	86	—	2	93.3	60	—	0	(37.5)	16
Performing arts	21	98.4	61	84.3	229	87.5	8	85.0	20
Philosophy	99	98.0	511	79.3	2,398	(62.5)	48	(54.4)	79
Political science	152	97.6	2,712	80.0	11,493	61.2	85	(49.0)	288
Population studies	36	92.9	424	75.2	7,470	(55.2)	29	37.8	233
Psychology	18	93.5	217	76.8	1,303	(53.8)	39	32.0	50
Public policy & administration	38	100.0	158	80.2	1,539	(100.0)	1	(37.5)	24
Religion	74	96.8	222	80.9	1,214	(52.4)	21	(48.9)	92
Slavic studies	19	96.1	359	88.0	876	73.8	42	66.2	71
Sociology	128	95.4	6,173	75.7	26,318	56.2	546	33.3	1,563
Statistics	50	95.1	535	84.0	1,259	(63.2)	19	(56.1)	98

Note. Non-kinships word pairs are *woman/man*, *women/men*, *girl/boy*, *girls/boys*, and *female/male*. Ratios are significantly different from a 50% even split unless presented in parentheses.

12.2%). The century average for each kinship word pair is significantly different from 50% [ts(100) $>$ 3.97; ps $<$ 0.001], with some coming close to an even distribution, such as "*uncle and aunt*" (57.1%) and "*nephew and niece*" (58.0%).

The pre-1970 average correlation coefficient between time and male-first ratios is −0.71, and the post-1970 average is −0.84. These correlations are not significantly different from each other; $t(22) = 1.57$, $p = .13$. There is thus a century-long decline in male-first ratios for conjoined phrases with kinship words which is evenly spread throughout the century and not concentrated to the post-1970 period.

Further supporting Hypothesis 1, the average male-first ratio for conjoined phrases with nonkinships words is significantly higher than that for kinship words, both in the pre-1970 period [$t(20) = 4.11$, $p = .001$], and after 1970 [$t(13.89) = 4.35$, $p = .001$].

Discussion of the Archival Studies

Studies 1, 2, and 3 drew on collective language patterns as captured in three corpora and found convergent support for Hypothesis 1. Conjoined phrases are less likely to start with the male

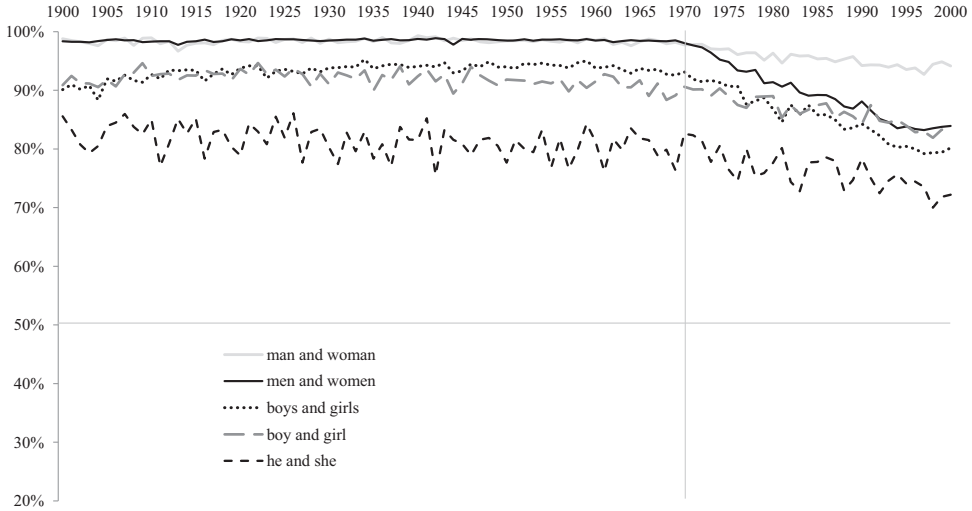

Figure 2. Historical patterns of male-first ratios over the 20th century for phrases with nonkinship word pairs conjoined by "*and*." Data were obtained from Google N-Gram Viewer.

party if they concern the kinship domain as opposed to the nonkinship domain. Male-first ratios for nonkinship word pairs also declined with women's growing public relevance after 1970, even though they are still in overwhelming preponderance.

Confidence in the validity of these patterns is strengthened by their consistency across multiple lexically gendered word pairs and three different corpora. The parallel historical patterns for two conjunctions (*and*, *or*) further render random drifts in language a less plausible alternative account for these patterns. Alternative accounts, however, are not entirely eliminated. The kinship and nonkinship domains were each represented through a small number of word pairs. Given this narrow sample, it is possible that the effect is due to chance or extraneous factors affecting a small number of specific word pairs.

The word order patterns we observed were shaped by several factors—relevance being only one of them. Relevance, according to our theoretical account, attains primacy by virtue of its accessibility when people construct phrases. But people may override accessible content and exert conscious control over their ordering choices. Writing, in particular, tends to engage controlled processes more than talking. These controlled processes may also explain why the male-first ratios declined after the 1970s for conjoined phrases involving the nonkinship domain. Some authors may have put women before men in a conscious effort to redress gender inequality symbolically.

Word order can also be prescribed by linguistic norms. Various linguistic communities consider it poor etiquette to refer to oneself

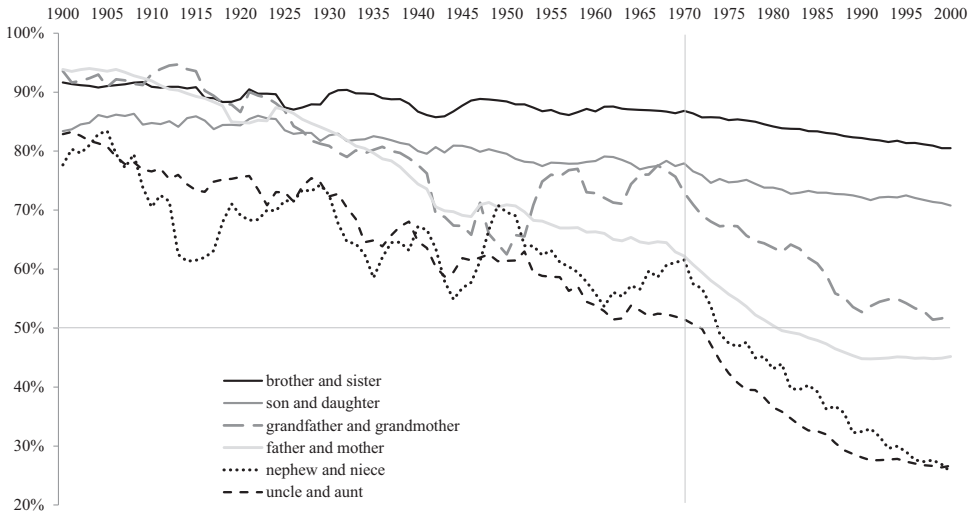

Figure 3. Historical patterns of male-first ratios over the 20th century for phrases with kinship word pairs conjoined by "*and*." Data were obtained from Google N-Gram Viewer. Data have been smoothed by 2 to enhance visual clarity and make trends more apparent. The graphed value for each year thus corresponds to the moving average for that year and the two years on either side of it.

Table 3
Ratio of Male-First Conjoined Phrases—Google N-Gram Search of Books (Study 3)

Word pair	Averages (%)			Correlations with time			Change (%)		Regression coefficients (%)	
	1900–2000	1900–1970	1971–2000	1900–2000	1900–1970	1971–2000	Century	Pre/Post, 1970	Constant	*B* (Time)
Non-kinship terms										
boy and girl	90.3	91.9	86.4	−.81	−.43	−.91	−8.5	−5.5	94.5	−.08
boy or girl	91.0	93.4	85.1	−.77	(−.12)	−.89	−11.4	−8.3	96.7	−.11
boys and girls	90.9	93.3	85.3	−.65	.61	−.97	−9.9	−8.1	95.9	−.10
boys or girls	85.5	88.2	79.1	−.79	−.38	−.92	−14.3	−9.1	92.7	−.14
he and she	79.8	81.3	76.0	−.70	−.35	−.72	−8.8	−5.3	84.2	−.09
he or she	97.5	98.1	96.0	−.72	(.04)	−.89	−2.8	−2.1	98.9	−.03
man and woman	97.5	98.4	95.4	−.75	(.03)	−.89	−4.1	−3.0	99.5	−.04
man or woman	97.3	98.5	94.5	−.80	−.45	−.92	−5.7	−4.0	100.1	−.06
men and women	95.7	98.5	89.2	−.76	(.18)	−.98	−12.8	−9.3	102.1	−.13
men or women	91.7	95.0	83.9	−.77	(−.05)	−.95	−15.2	−11.1	99.3	−.15
Kinship terms										
brother and sister	87.1	88.7	83.3	−.83	−.59	−.92	−9.7	−5.4	91.9	−.10
brother or sister	90.6	91.2	89.2	−.51	−.32	−.53	−4.0	−2.0	92.6	−.04
father and mother	69.9	78.7	49.2	−.99	−.97	−.91	−55.5	−29.5	97.7	−.55
father or mother	70.6	79.0	50.7	−.98	−.96	−.87	−52.0	−28.3	96.6	−.52
grandfather and grandmother	74.4	80.7	59.6	−.88	−.72	−.90	−41.1	−21.1	95.0	−.41
grandfather or grandmother	77.3	84.2	60.9	−.76	−.45	−.70	−39.8	−23.3	97.2	−.40
nephew and niece	58.0	66.2	38.5	−.82	−.51	−.89	−46.7	−27.7	81.3	−.47
nephew or niece	68.9	78.2	47.1	−.81	−.46	−.79	−49.9	−31.1	93.9	−.50
son and daughter	79.2	81.8	73.1	−.89	−.72	−.69	−15.7	−8.7	87.0	−.16
son or daughter	94.6	95.2	93.2	−.48	(−.11)	−.66	−3.1	−2.0	96.2	−.03
uncle and aunt	57.1	66.9	34.0	−.95	−.88	−.92	−58.8	−33.0	86.6	−.59
uncle or aunt	62.3	69.9	44.4	−.83	−.64	−.89	−49.7	−25.5	87.2	−.50

Note. For the regression, the time variable was assigned values from 0 to 100, such that the constant is the prediction for the year 1900 and *B* values are estimates of yearly change.

before others, as in "*me and my friends*." This sentiment is codified in a German proverb which says that a donkey always puts itself first (*Der Esel nennt sich immer zuerst*). Such a prescriptive norm also used to regulate the order of gender references in English: Historically, the male-first order has been prescribed as the correct way of expression (Bodine, 1975). In 1553, Englishman Thomas Wilson published *The Arte of Rhetorique*, which is now considered the first complete work of rhetoric in English, and was very popular with the reading elite of its day (Wagner, 1960). On the proper way of ordering words, the book said "the worthier is preferred and set before. As a man is set before a woman." (p. 208; Wilson, 1560/1909).[5] On the impropriety of referring to one's mother before one's father, it said:

> *Some will set the Cart before the horse, as thus: My mother and my father are both at home, as though the good man of the house did wear no breeches, or that the gray Mare were the better Horse.* [. . .] *yet in speaking at the least, let us keep a natural order, and set the man before the woman for manners sake.* (p. 167). . . . *Who is so foolish as to say, the Counsaile and the King, but rather the King and his Counsaile, the Father and the Sonne, and not contrary.* (p. 168; Wilson, 1560/1909)

This code for proper writing has presently waned but its onetime existence may partly explain the unhypothesized drop in kinship word pairs we observed throughout the whole century. This steady decline could be reflecting the gradual fading of the now-obsolete prescription to always put the man first. Released from this grip, word order may have come to more closely reflect real or presumed gender differences in relevance and tipped toward female primacy in the family domain.

Overall, the archival studies have provided us with evidence for the role of macro context in collective word order patterns. The next two studies examine the ad hoc construction of conjoined phrases and the factors implicated in this process.

Study 4

Participants saw a picture of the same two people in a stereotypically male office setting, or a stereotypically female schoolroom setting. They were invited to describe what they saw. The questions were whether contextual relevance cues would affect who participants mention first in their descriptions (Hypothesis 1), and whether they would be more likely than chance to reproduce collectively preferred order patterns for conjoined phrases (Hypothesis 2).

In two ways, the testing method of Hypothesis 1 departs from the archival studies. First, Study 4 invited participants to construct conjoined phrases in response to a specific stimulus. As a result, the referents of the conjoined phrases are controlled for—they are the same two people except for their context. Second, Study 4 operationalizes context differently than did the archival studies. In the archival studies, context was residing in the meaning of word

[5] When quoting from this source, some of the spelling and punctuation has been modified in accordance with contemporary language usage for ease of comprehension.

pairs whose collective patterns were investigated (e.g., *congressman*, *mother*). This time, context is operationalized through the physical setting in which the two people are embedded (office vs. classroom).

Method

Participants. Participants were 647 individuals (337 female, 310 male) recruited from Amazon's Mechanical Turk (*median age* = 33, *M* = 35.57, *SD* = 11.81), who declared English as their native language. Sample size was predetermined on the expectation of a small effect size and with the knowledge that only a subset of the participants would produce conjoined phrases in response to study instructions.

Materials and procedure. In an online survey, participants were presented with one of two pictures (see Figure 4). One picture showed a woman and a man in an office, sitting behind a desk with a computer screen on it, against a background of bookshelves. The second picture was created in Photoshop by pasting the heads of the woman and man from the first picture onto another picture. This second picture depicted two people in a primary school classroom, sitting behind a desk with notebooks on it, against a background of school supply shelves.

The relative positions of the man and woman on the picture were counterbalanced such that half of the participants saw an original picture, and the other half saw the original picture rotated around its vertical axis. Participants were instructed: "*Please take a look at the picture below and describe in 1–2 sentences what you see*."[6]

Figure 4. Stimuli pictures for Study 5. See the online article for the color version of this figure.

Results and Discussion

Participants' descriptions were first coded for gender differentiation. 64.8% of all descriptions (*n* = 419) referred to the gender of the depicted individuals, whereas the rest used generic terms like "*people*" and "*teachers*." Gender-differentiated descriptions were further coded for the presence of conjoined phrases with lexical gender. Of the gender-differentiated responses, 89.0% (*n* = 373) included conjoined phrases (e.g., "*It's an older man and woman sitting in a classroom at a table*"). The rest made references to gender without using conjoined phrases (e.g., "*I see a secretary consulting with her manager about something*").

Hypothesis 1 was tested first. Table 4 presents the ratio of descriptions and the ratio of conjoined phrases in which the man was mentioned first. When the setting was the office, 89.9% of the 208 gender-differentiated descriptions mentioned the man first. In comparison, when the office was a classroom, 79.1% of the 211 gender-differentiated descriptions mentioned the man first. This is a significant difference of 10.8%; $\chi^2(1) = 9.25$, $p = .002$.

For the subset of these gender-differentiated descriptions with conjoined phrases, a similar pattern obtains. Of the 184 conjoined phrases produced by participants who saw the two people in the office setting, 92.4% had the man in the first position. In comparison, of the 189 conjoined phrases produced by participants who saw the same people in a primary classroom setting, 85.7% had the man in the first position. This is a significant difference of 6.7%; $\chi^2(1) = 4.25$, $p = .039$. Put differently, female-first conjoined phrases were almost twice as likely to be produced when describing the same two people in a classroom (14.3%) rather than in an office (7.6%).

These results were further probed by testing the role of picture orientation and participant gender. Four logistic regressions were run, predicting the ratio of male-first descriptions and the ratio of male-first conjoined phrases for each of the two pictures (see Table 5). Picture orientation made a difference such that being on the left side of the picture significantly increased the odds of initial position in three of the four models. For example, 98.9% of conjoined phrases started with the man when the man was on the left in the office picture, whereas this ratio was 85.7% when the woman was on the left; $p = .008$. Participant gender was not a significant predictor in any of the four models; $ps > .18$.

Tested next was Hypothesis 2, which says that people will tend to reproduce collectively preferred word order patterns. Of the various lexically gendered word pairs participants used, three had counts higher than 10. These were *man/woman* (*n* = 332), *male/female* (*n* = 15), and *businessman/businesswoman* (*n* = 13). All three of these word pairs exhibit predominantly male-first collective patterns, as documented in Studies 1–3. It was thus expected that the majority of constructions with these word pairs would start with the male party.

This expectation was supported for all three word pairs. Of the conjoined phrases participants constructed with the *man/woman* word pair, 89.2% started with *man*. This ratio is significantly different from an even split; ($\chi^2 = 202.05$, $p < .0001$). All 100%

[6] In this study and the following, all administered manipulations are reported. All measures are reported with the exception of some additional questions in this study and Study 7 that are not relevant to the current hypotheses.

Table 4
Ratio of Male-First Conjoined Phrases and Male-First Picture Descriptions With Results of Logistic Regression by Presentation Order and Participant Gender – (Study 4)

		Results by presentation order				Results by participant gender			
Dependent variable by setting	Overall	Female on the left	Male on the left	Odds ratio	*p*	Female participants	Male participants	Odds ratio	*p*
Male-first descriptions									
Office picture	89.9%	82.4%	97.2%	7.20	.002	91.7%	87.5%	1.42	.46
Classroom picture	79.1%	71.6%	87.3%	2.83	.005	78.6%	79.8%	.79	.50
Male-first phrases									
Office picture	92.4%	85.7%	98.9%	15.95	.008	91.7%	93.3%	.66	.48
Classroom picture	85.7%	81.9%	89.5%	2.07	.10	83.3%	88.9%	.55	.18

of the conjoined phrases participants constructed with the word pairs *male/female* and *businessman/businesswoman* started with the male party. These distributions are again significantly different from an even split; χ^2s > 13, *p*s $< .0003$.

Study 4 simultaneously tested Hypotheses 1 and 2 and found support for both. People were more likely to refer to a party first when it appeared in a stereotype-consistent rather than stereotype-inconsistent context. At the same time, there was a strong tendency to reproduce common word order patterns for three different word pairs. This suggests that most people will opt for the generic order when constructing conjoined phrases, at least when the relevance differences are not clear and strong enough to reverse it.

Study 5

Study 5 provides a second test of Hypothesis 2 which states that people have a tendency to reproduce common word order patterns. Participants were presented with a decontextualized language task in which they had to form sentences out of a scrambled set of words (e.g., Srull & Wyer, 1979). Four scrambled word sets included the word pairs *businesswoman/businessman*, *congresswoman/congressman*, *boy/girl*, and *father/mother*. Given the ratios observed in Studies 1, 2, and 3, participants were expected to predominantly produce male-first phrases with the three nonkinship word pairs, but not with the *mother/father* word pair.

Method

Participants. Participants were 67 women and 63 men (median age = 34, $M = 37.2$, $SD = 12.8$) recruited on Amazon's Mechanical Turk. Participation was limited to those who declared English as their native language. Sample size was predetermined.

Materials and procedure. Participants were presented with 12 scrambled sentences (e.g., "*chamomile - cup - I - of - a - tea - ordered*"). Their task was to form a meaningful sentence using all given words ("*I ordered a cup of chamomile tea*"). Four of the scrambled sentences required participants to conjoin gendered words. These sentences were (a) "*The businessman and businesswoman signed a deal*," (b) "*The congressman and congresswoman voted against the bill*," (c) "*A boy and a girl entered the store*," and (d) "*The mother and father discussed school options*."

The presentation order of female and male words was counterbalanced such that half of the time the female word came first in the scrambled word set and half of the time the male word came first.

At the end of the study, participants were asked whether they noted anything about the task that they wanted to comment on.

Results and Discussion

In response to the suspicion probe, 13 participants referred to the gendered words in the sentences and 5 of them mentioned the

Table 5
Ratio of Male-First Conjoined Phrases and Results of Logistic Regression by Presentation Order and Participant Gender (Study 5)

		Results by presentation order				Results by participant gender			
		Ratio of male-first phrases		Logistic regression results		Ratio of male-first phrases		Logistic regression results	
Word pair	Overall	Female presented first	Male presented first	Odds ratio	*p*	Female participants	Male participants	Odds ratio	*p*
Non-kinship terms									
businessman/businesswoman	68.9%	57.6%	79.4%	2.89	.01	62.5%	75.9%	.51	.10
congressman/congresswoman	65.0%	48.4%	83.1%	5.06	<.001	55.6%	75.0%	.44	.05
boy/girl	64.5%	37.1%	91.9%	20.73	<.001	58.5%	71.2%	.46	.10
Kinship terms									
father/mother	39.2%	8.2%	68.8%	25.23	<.001	40.0%	38.3%	1.33	.55

order of these words as a source of uncertainty or the probable focus of the study. Reported analyses exclude these 5 participants.[7]

The ratio of male-first constructions was calculated as a percentage of all constructions (see Table 5). As expected, the order tended to be male-first for the three word pairs that do not belong to the family sphere: The male-first ratio was 68.9% for *businesswoman/businessman*, 65.0% for *congresswoman/congressman*, and 64.5% for *girl/boy*. In contrast, the *mother/father* word pair produced a female-first pattern, with a male-first ratio of 39.2%. Each of these ratios are significantly different from an even split; χ^2s(1) $>$ 5.83, *p*s $<$ 0.02.

Next, four logistic regression analyses were conducted predicting the order of each conjoined phrase from participant gender and the order in which the gendered terms were presented in the scrambled word set. For all four word pairs, this model was significantly more successful than a constant-only model; χ^2s(2) $>$ 9.48, *p*s $<$ 0.01. Participants were significantly more likely to reproduce the order in which the words were presented in the scrambled version (see Table 5 for logistic regression results and percentages of male-first phrases). Across the three nonkinship word pairs, participants left the female word in the first place 52.4% of the time when it was presented first in the scrambled set, and reversed the order to a male-first one 47.6% of the time. In contrast, when the male word was presented first, participants reproduced this order 84.8% of the time, and only 15.2% of the time did they reverse it to a female-first order. For the *mother/father* word pair, participants left the word *mother* in the first place 91.8% of the time when it was presented first in the scrambled set, and reversed it to a female-first order 32.1% of the time when *father* was presented first.

There was also an effect of participant gender, albeit a smaller one than that of presentation order. Although female participants were less likely than male participants to put the male word first for the three nonkinship terms, this trend reached significance only for the *congressman/congresswoman* word pair. Overall, female participants created male-first conjoined phrases with nonkinship words 58.9% of the time and male participants created male-first conjoined phrases 74.0% of the time, a significant difference that suggests personal identity as a factor in ordering choices; χ^2s(1) $>$ 9.45; $p = .002$. For the *father/mother* word pair, there was no relationship between participant gender and the ratio of male-first phrases ($p = .85$).

In sum, a sizable proportion of participants chose to reverse the given order of words in the scrambled set to render the conjoined phrase consistent with common word order patterns. In combination, Studies 4 and 5 provide convergent evidence for Hypothesis 2, suggesting that people tend to produce prevalent word order patterns which are often also consistent with stereotypical orderings of relevance. This tendency can be consequential if word order affects attributions of relevance. We now turn to the effects of word order on the audience. Studies 6 and 7 test Hypothesis 3 which states that audiences will attribute stronger relevance to a gender when that gender is mentioned first rather than second in a conjoined phrase.

Study 6

In Studies 6a and 6b participants read a text with conjoined phrases which were presented either in male-first or female-first order. They then had to guess the more central gender in the described situation.

Study 6a Method

Participants. Eighty-one participants (37 female, 44 male) who declared English as their native language were recruited on Amazon's Mechanical Turk (*median age* = 30, $M = 32.9$, $SD = 10.73$). Sample size was predetermined.

Materials and procedure. The survey was introduced as a study of how people go beyond given information when they form impressions. Participants were told that they were going to read a text along with some background information, and then answer questions about it. The instructions stated that the questions were not explicitly answered in the text but the researchers were interested in participants' best guesses. Participants then read the following background information and text:

> The following has been written by a high school sophomore about her athletic activities:
>
> I try hard to give my best in tennis practice. My [mother and father OR father and mother] have met the coach last week. The coach told them that I was making steady progress and had a great attitude, but also some lingering weaknesses. My [mother and father OR father and mother] told me afterwards that they want me to work on my weaknesses, but not worry too much about them, because enjoying the game is important too.

After two filler questions (e.g., "*Based on your impression, how much does this student like playing tennis?*"), participants were presented with the measure of perceived relevance. They were asked "*Based on your impression, who is more involved in this student's tennis life?*," and had to choose between "*her mother*" and "*her father*," displayed in counterbalanced order.

Study 6a Results

When the mother was mentioned first in the stimulus text, 53.5% of the participants said that the mother was more involved in the student's tennis life, and the remaining 46.5% said that the father was more involved. In contrast, when the father was mentioned first, only 18.4% of the participants said that the mother was more involved, and 81.6% said that the father was more involved. These distributions are significantly different from each other; $\chi^2(1) = 10.64$, $p = .001$.

Participant gender was not a significant predictor of choices; $\chi^2(1) = .036$, *ns*.

Study 6b Method

Participants. Eighty-two participants (33 female, 49 male) who declared English as their native language were recruited on Amazon's Mechanical Turk (*median age* = 31, $M = 33.04$, $SD = 9.33$). Sample size was predetermined.

Materials and procedure. Procedures were identical to those of Study 6a except for the background information and text presented to participants. Participants read:

[7] Results are within a 1% margin of the reported findings when all participants are included or all 13 participants who mentioned gender in their response are excluded.

> The following has been written by a news reporter who covers local protests against a power plant proposal in a Delaware town:
>
> The proposal of a 279-megawatt natural-gas power plant has drawn much opposition from the townspeople. Some of the town's [women and men OR men and women] are out on the streets, talking to the locals individually about what they see as the dangers of the proposed facility. Yesterday, hundreds of protesters have staged a demonstration in front of the town hall. These [women and men OR men and women] are mainly worried about pollution and ecological damage. They want the township Board of Supervisors to vote against the proposal.

Participants again answered two filler questions (e.g., "*Based on your impression, what is the population of the town in question*?"), and were then presented with the measure of perceived relevance. They were asked "*Based on your impression, which group is playing a more central role in the organized protests*?" and had to choose between "*women*" and "*men,*" displayed in counterbalanced order.

Study 6b Results and Discussion

When women were mentioned first in the text, 70.7% of the participants said that women were more central to the organized protests, and the remaining 29.3% said men were more central. In contrast, when men were mentioned first, only 34.1% of the participants said that women were more central, and 65.9% said men were more central. These distributions are again significantly different from each other; $\chi^2(1) = 11.002$, $p < .001$.

This time, participant gender was a significant predictor of choices such that male participants across the two conditions were more likely to claim higher centrality for men (61.2%) than female participants did (27.3%); $\chi^2(1) = 9.11$, $p = .003$.

Even though Studies 6a and 6b involved different contexts and were run on different samples, reversing word order had a similar effect in both studies. In Study 6a, when a party was mentioned first rather than second, it was nominated as more central by an additional 35.1% of the participants. In Study 6b, this premium was 36.6%. This convergence suggests that word order may have comparable effects across contexts—a conjecture in need of further investigation.

Even though we are interested in relevance attributions to the same party in the first versus second positions, it is interesting to reflect on how much relevance people attribute to the first party compared to the second. In Study 6a, when participants read about the student athlete talking about her "*mother and father*," the proportion of participants assigning more relevance to the mother (53.5%) was not statistically different from the proportion assigning more relevance to the father (46.5%). In contrast, when participants in Study 6b read about "*men and women*" in the context of political activism, significantly more than half of them (65.9%) assigned stronger relevance to men than women. These patterns illustrate that people do not automatically assign more relevance to the first-mentioned party. Background assumptions also play a role in inferences of relevance—in this case assumptions about who would be more interested in a daughter's athletic life and tell her "enjoying the game is important too," or who would be more likely to play a central role in political activism.

Although Study 6 supports Hypothesis 3, it relied on a single-item measure of perceived relevance. Study 7 subjects Hypothesis 3 to a more rigorous test with an extended set of measures.

Study 7

In Study 7 participants were asked to write a story about "*a businesswoman and a businessman*" or "*a businessman and a businesswoman*." Based on Hypothesis 3, it was predicted that the businesswoman would feature more centrally in stories about a "*businesswoman and a businessman,*" and vice versa.

Method

Participants. One hundred sixty-eight participants (88 female, 80 male) who declared English as their native language were recruited on Amazon's Mechanical Turk (*median age* = 29, M = 32.24, SD = 11.55). Sample size was predetermined on the expectation of a small to medium effect size.

Materials and procedure. Participants were told that they were going to write a story for five minutes. Half of the participants were instructed: "*Please write a story about a businesswoman and a businessman. You can write any story that you want, as long as it involves a businesswoman and a businessman*." The other half received the same instructions, with the order of "*businesswoman and businessman*" reversed in both sentences.

Results and Discussion

Seven participants (3 female, 4 male) were excluded from the analyses because they violated study instructions by writing about themselves or about one businessperson only.

The median story was 177 words long (M = 192.1, SD = 108.0). To assess the relative centrality of the businesswoman and businessman in these stories, three different measures were used as described below (see Table 6 for all results).

First mention. The first measure of centrality was whether a party was mentioned first in the story. This measure is justified by Hypothesis 1 which states that more relevant parties are more likely to be mentioned first.

Across the full set of stories, the businessman was significantly more likely to be mentioned before the businesswoman, with 68.3% of the stories first mentioning the man, and 31.7% the woman; $\chi^2(1, N = 161) = 21.62$, $p < .0001$. This ratio may be reflecting the stronger association of business with men and is consistent with Hypothesis 1. Nevertheless, the instructions made a difference. The ratio of stories mentioning the businessman first was 87.5% for stories written about "*a businessman and a businesswoman*," whereas it was 49.4% for stories written about "*a businesswoman and businessman*"; $\chi^2(1, N = 161) = 27.02$, $p < .0001$.

Participant gender also significantly predicted who was mentioned first. Stories written by male participants were more likely to first mention the man (81.6%) compared with stories written by female participants (56.5%); $\chi^2(1, N = 161) = 11.69$, $p < .001$.

Word count of lexically gendered words. The relative centrality of female and male characters in the story was further approximated by counting the occurrence of feminine and masculine pronouns (*she*, *her*, *herself*, *he*, *his*, *him*, *himself*) and words presumably referring to the two main characters (*woman*, *man*,

Table 6
Centrality of the Female and Male Characters as a Function of Story Instructions and Participant Gender (Study 7)

Condition	Participant gender	First mention: Man	Word count: Female %	Word count: Male %	Centrality Mean (*SD*)	Relative status Mean (*SD*)	Woman's agency Mean (*SD*)	Man's agency Mean (*SD*)
Woman first	Male (n = 37)	62.2%	3.45%	3.90%	2.18 (.68)	1.88 (.46)	4.86 (1.59)	5.15 (1.33)
	Female (n = 44)	38.6%	5.18%	4.00%	1.80 (.67)	2.17 (.66)	5.08 (1.46)	5.17 (1.31)
	Total	49.4%	4.48%	3.96%	1.97 (.70)	2.04 (.59)	4.98 (1.52)	5.16 (1.31)
Man first	Male (n = 39)	100.0%	2.61%	3.66%	2.28 (.47)	1.87 (.51)	4.96 (1.56)	4.77 (1.61)
	Female (n = 41)	75.6%	3.45%	4.01%	2.09 (.58)	2.18 (.53)	4.94 (1.68)	5.50 (1.33)
	Total	87.5%	3.04%	3.84%	2.18 (.54)	2.03 (.54)	4.95 (1.61)	5.14 (1.51)
Total	Male (n = 76)	81.6%	3.03%	3.78%	2.23 (.58)	1.88 (.48)	4.91 (1.57)	4.95 (1.49)
	Female (n = 85)	56.5%	4.45%	4.01%	1.94 (.64)	2.18 (.60)	5.01 (1.56)	5.33 (1.32)
	Total	68.3%	3.82%	3.90%	2.07 (.63)	2.03 (.56)	4.97 (1.56)	5.15 (1.41)

businesswoman, *businessman*). This measure has some noise because stories occasionally included extra characters and some participants gave names to their characters, thus dispensing with generic gender descriptors.

Across the two conditions, 3.82% of the words participants wrote referred to a woman as captured by this measure, and 3.90% of the words they used referred to a man. This is not a statistically significant difference; $\chi^2(1) = 0.29$, $p = .59$. But instructions again made a difference. When participants wrote about "*a businessman and a businesswoman*," 3.04% of their words referred to a woman and 3.84% of their words referred to a man—a significant difference favoring the man, $\chi^2(1) = 13.56$, $p < .001$. In contrast, when participants wrote about "*a businesswoman and a businessman*," 4.48% of their words referred to a woman and 3.96% of their words referred to a man—a significant difference favoring the woman, $\chi^2(1) = 5.58$, $p = .02$.

Participant gender also predicted the number of references to the woman and man in the stories. In female participants' stories, 4.45% of the words referred to a woman, and 4.01% of the words referred to a man—a significant difference showing that female participants referred to the businesswoman in their stories more often than they referred to the businessman; $\chi^2(1) = 4.14$, $p = .04$. In male participants' stories, 3.03% of the words referred to a woman, and 3.78% of the words referred to a man. This is also a significant difference showing that male participants referred to the businessman in their stories more often than they referred to the businesswoman; $\chi^2(1) = 11.56$, $p < .001$.

When we cross the experimental condition with participant gender and compare the four cells, an interesting pattern obtains (see Table 6). The ratio of references to the male character ranges between 3.66% and 4.01%, and does not significantly differ across the four cells; $\chi^2(3) = 1.60$, $p = .66$. In contrast, the ratio of references to the female character significantly differs across conditions; $\chi^2(3) = 82.6$, $p < .0001$. The lowest ratio is found in male participants' stories about "*a businessman and a businesswoman*" (2.61%), and the highest ratio in female participants' stories about "*a businesswoman and a businessman*" (5.18%). Perhaps because a certain level of male presence is taken for granted in business by women and men alike, the centrality assigned to the businessman did not shift as readily as the centrality assigned to the businesswoman.

Story codings. As a final measure of centrality, two research assistants blind to hypotheses, experimental condition, and participant gender coded who was more central to each story (1 = *woman more central*, 2 = *both equally central*, 3 = *man more central*), the relative status of the two characters (1 = *woman has higher status*, 2 = *they have equal status*, 3 = *man has higher status*), and the agency of the businesswoman and businessman in the story (1 = *very low agency*, 7 = *very high agency*). Cronbach's alphas were 0.86 for the centrality coding, 0.80 for the relative status coding, 0.79 for the businesswoman's agency coding, and 0.74 for the businessman's agency coding. Ratings from the two coders were averaged for the subsequent analyses.

Paralleling previous results, coders' perceptions of the two characters' relative centrality did shift with study instructions. The businessman was judged significantly less central in stories about "*a businesswoman and a businessman*" ($M = 1.97$, $SD = 0.70$), compared with stories about "*a businessman and a businesswoman*" ($M = 2.18$, $SD = 0.54$); $F(1, 157) = 4.29$, $p = .04$, Cohen's $d = 0.34$. In contrast, the relative status and agency ratings of the characters were not associated with story instructions; Fs(1, 157) < 0.031, ps > 0.91.

Participant gender again predicted who was judged more central to the story, such that the businessman was judged more central in the stories written by men ($M = 2.23$, $SD = 0.58$) compared with the stories written by women ($M = 1.94$, $SD = 0.64$); $F(1, 157) = 9.09$, $p = .003$, Cohen's $d = 0.48$. Interestingly, the businesswoman was judged to have higher relative status in the stories written by men ($M = 1.88$, $SD = 0.48$) compared with the stories written by women ($M = 2.18$, $SD = 0.60$); $F(1, 157) = 12.07$, $p = .001$, Cohen's $d = 0.56$. Participant gender did not significantly predict agency ratings; Fs(1, 157) < 2.90, ps > 0.09.

In a two-way ANOVA with experimental condition and participant gender as the predictors, and the four ratings as the dependent variables, none of the interaction terms were significant; Fs(1, 157) < 2.58, ps > 0.11.

Overall, Study 7 shows that the order of the two genders in a conjoined phrase has communicational consequences. When the woman was mentioned before the man in a business context, participants constructed an imaginary world in which the woman was more central and received more attention. These findings provide further evidence for the order of conjoined words as a relevance cue.

General Discussion

Drawing on psycholinguistic research, I suggested that word order is a function of and cue for relevance. These claims were tested and supported in the case of lexically gendered words pairs. Over the 20th

century, conjoined phrases with lexically gendered words were less likely to start with the male party if they concerned the family domain as opposed to not. We saw that context could shift the order of references to the two genders but people also display a tendency to repeat predominant word orders. These word order choices have social consequences because they affect a gender's perceived relevance in a context and can thus reinforce stereotypical beliefs.

The broader question that this work addresses is about the ways in which people configure symbolic creations. Previous research on this question has linked prime positions to factors such as agency, power, status, and masculinity (e.g., Benor & Levy, 2006; Hegarty et al., 2011; Maass et al., 2009; McGuire & McGuire, 1992). The proposed relevance account offers a unified explanation for why these attributes often occupy primary positions, but also predicts when they would be less likely to. Even though the data did support its predictions, the full theoretical account remains largely untested. Validating it will require at least three additional steps.

The first step is establishing the generalizability of the findings. The reported studies were restricted to a subset of conjoined phrases with lexically gendered words. We would like to know whether the effects generalize to other references to gender, such as phrases with proper nouns, to social categories other than gender, such as race, age and occupation, and to languages other than English.

A second step is testing whether relevance characterizes more accurately and parsimoniously the semantic factors associated with word order choices than its alternatives such as agency and power. When relevance does not coincide with agency and power, would people put the more relevant party before the more powerful or agentic party? Conversely, when a party is put first instead of second, would people perceive higher relevance, but not necessarily more agency or power? The reported studies do not offer discriminant evidence for the superior theoretical value of relevance over its alternatives, with the minor exception of Study 7. To establish the validity of the relevance account, further research should orthogonally manipulate and measure relevance, agency, power, and status.

A third step is testing the mediating role of accessibility in the production and comprehension of conjoined phrases. The current studies do not offer any evidence on underlying cognitive processes. Further research that assesses cognitive accessibility, such as by eye-tracking methods or reaction time measurement, will help us better understand the cognitive underpinnings of the link between primary positions and relevance.

In addition to a deeper examination of the proposed theoretical account, we would like to have a better understanding of the factors that moderate the documented effects. One candidate moderator is how much of a relevance difference communicators presume to exist between the two parties when they are forming a conjoined phrase or inferring relevance information from it. When people form a conjoined phrase, the odds of first mention may increase for a party to the extent that it is unambiguously and strictly more relevant. For example, if fathers are unquestionably more relevant in a setting than mothers, people may be less likely to repeat the common phrase "*mothers and fathers*." In contrast, the tendency to reproduce common patterns may be greater when relevance differences are unclear or weak—as was the case in Studies 4 and 5.

Prior beliefs about a relevance difference may also affect the relevance information people extract from word order— as we have seen in Studies 6 and 7. A potential boundary condition here is when a relevance difference is not plausible at all. Both in Study 6 and Study 7, it was entirely conceivable that the parties might differ in their relevance. But what would happen if it weren't? Let us for example imagine a book titled "*The Reading Habits of Middle-Class English Men and Women*." The ordering of "*men and women*" seems to simply follow linguistic convention here, and a relevance difference is implausible: We would hardly expect that the reading habits of one gender will get more attention than the other's. If the order were flipped though, and the book were titled "*The Reading Habits of Middle-Class English Women and Men,*" would we still expect no difference in the treatment of the two genders? Or would we perhaps expect a stronger emphasis on women's reading habits than men's, given the deviation from conventional phrasing?

Even when a relevance difference is implausible, the effect may not disappear given the privileged processing of initial elements (Gernsbacher & Hargreaves, 1988). We have seen how the masculine generic evokes mental images of men even if people know it was used in the generic sense (Gastil, 1990; Moulton, Robinson, & Elias, 1978; Hamilton, 1988; Hyde, 1984). The popular alternative to the masculine generic, "*he or she*," may evoke a mental image in which the female is present, but at the periphery. The generic "*mothers and fathers*" may evoke a mental image in which mothers are more salient than the fathers. A secondary position may thus unintentionally marginalize its occupant, even if it is used in the generic sense and a relevance difference is unlikely—a possibility awaiting future testing.

Conclusion

This work has studied how word order in conjoined phrases can be a means of expressing and shaping gender beliefs. The findings have potential implications for social justice: By ordering words one way rather than the other, we may inadvertently reinforce stereotypical gender beliefs, and conversely, by choosing the opposite order, we may ever so slightly puncture a gender stereotype. A better understanding of the communicational significance of word order is hoped to foster broader cognitive inclusion for all of us.

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