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Women's Social Relevance: Public Attention for Private Matters

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WOMEN'S SOCIAL RELEVANCE:
PUBLIC ATTENTION FOR PRIVATE MATTERS

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A DISSERTATION
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Abstract

Social invisibility research on the relevance and representation of different social groups suggests that women, as members of a marginalized social group, have more constrained representational repertoires and thereby fewer domains in which they are considered contextually relevant. Additionally, research on sexual objectification shows that women are more likely than men to be represented and perceived as objectified bodies as opposed to agentic subjects with minds. We combine these two formerly parallel lines of research and propose that women gain social relevance and representation in the public sphere through their physical visibility as opposed to their social audibility, while men have broader public relevance that is not contingent on context.

Selective attentional directing as determined through visual fixation indeed demonstrates that women are considered more attentionally relevant than men in a context of exclusively physical visibility; however, once the context shifts to include social audibility as well as physicality, there is a corresponding shift in visual attention away from women but not from men. Results related to source memory similarly show that women are less memorable (and thereby less relevant) as audible subjects even though they received more attention as physical objects, with statements made by female speakers more likely to be misattributed than statements made by male speakers. Finally, a series of studies on evaluative ratings of audibility (as expressed through opinion editorials) demonstrate that the relationship of physical visibility and social audibility for women (but not men) is a dichotomous one, such that the privileging of the female body comes at the direct expense of the relevance of the female mind in evaluations of women's audibility.

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Table of Contents

Abstract	ii
Acknowledgements	iii
Contents	v
List of Tables	vi
List of Figures	vii
Introduction	
Social Representation and Relevance	1
Public versus Private: Conditions of Female Social Relevance	6
Researching Relevance	14
Study 1: Relevance Determined through Attention and Memory	22
Study 2: Evaluative Tradeoffs of Appearance and Personhood	56
Study 2a	59
Study 2b	67
Study 3: Replication of Studies 2a and 2b	73
Study 3a	73
Study 3b	78
General Discussion	83
Future Directions	86
References	89
Appendixes	97

List of Tables

Table 1	48
<i>Hierarchical multiple regression analysis of likelihood of speaker misattribution</i>	
Table 2	49
<i>Hierarchical multiple regression analysis for male subjects only of likelihood of speaker misattribution</i>	
Table 3	50
<i>Hierarchical multiple regression analysis for female subjects only of likelihood of speaker misattribution</i>	
Table 4	61
<i>Four study conditions based on the inclusion of a photograph and a biography with the article</i>	

List of Figures

<i>Figure 1.</i> Sexual orientation labeling based on target behaviors and personal character.	10
<i>Figure 2.</i> Sexual orientation labeling based on target vocal patterns.	11
<i>Figure 3.</i> Basic Skype movie screen layout.	30
<i>Figure 4.</i> Skype movie screen layout with current speaker indicated.	31
<i>Figure 5.</i> Speaker selection screen for source memory task.	33
<i>Figure 6.</i> Visual fixation on silent male and female targets.	37
<i>Figure 7.</i> Visual fixation on male and female targets following neutral questions.	39
<i>Figure 8.</i> Change in visual fixation from baseline following neutral questions.	40
<i>Figure 9.</i> Visual fixation on male and female targets following feminine questions.	41
<i>Figure 10.</i> Change in visual fixation from baseline following feminine questions.	42
<i>Figure 11.</i> Visual fixation on male and female targets during speech.	43
<i>Figure 12.</i> Recognition memory for male and female targets' statements.	44
<i>Figure 13.</i> Misattribution (incorrect source recall) of male and female targets' statements based on subject sex.	45

<i>Figure 14.</i> Intrasex misattribution of male and female targets' statements based on subject sex.	47
<i>Figure 15.</i> For <i>female subjects</i> , the relationship between visual fixation and misattribution for <i>male</i> targets (left graph) and <i>female</i> targets (right graph).	50
<i>Figure 16.</i> Article evaluation ratings based on the inclusion of a photograph and a biography with the article (Study 2a).	63
<i>Figure 17.</i> Author competence ratings based on the inclusion of a photograph and a biography with the article (Study 2a).	65
<i>Figure 18.</i> Article evaluation ratings based on the inclusion of a photograph and a biography with the article (Study 2b).	69
<i>Figure 19.</i> Author competence ratings based on the inclusion of a photograph and a biography with the article (Study 2b).	69
<i>Figure 20.</i> Author morality ratings based on the inclusion of a photograph and participant sex (Study 2b).	70
<i>Figure 21.</i> Mean evaluations based on author sex.	72
<i>Figure 22.</i> Article evaluation ratings based on the presence of appearance information and personhood information (Study 3a).	77

Figure 23. Author competence ratings based on the inclusion of a photograph and a biography with the article (Study 3a). 78

Figure 24. Article evaluation ratings based on the inclusion of a photograph and a biography with the article (Study 3b). 81

Figure 25. Author competence ratings based on the inclusion of a photograph and a biography with the article (Study 3b). 81

"Imaginatively, [woman] is of the highest importance; practically, she is completely insignificant. She pervades poetry from cover to cover; she is all but absent from history." -Virginia Woolf, A Room of One's Own

Social Representation and Relevance

Despite intuitions founded in North American individualism, creating a self-identity is not an exclusively individual process; instead, the development and maintenance of the self is largely social in nature, reliant on a shared culture and the interpersonal communications and ideas that culture provides. Culturally available social representations thereby not only establish an identity framework for *oneself*, but also simultaneously enable and constrain the interpretation of this constructed self for *others* in one's social environment through collectively understood categorizations and conceptual representations (Fryberg, Markus, Oyerman, & Stone, 2008; Howarth, 2006; Markus & Oyerman, 1989; Oyerman & Markus, 1998; Voelklein & Howarth, 2005).

The adoption of a set of identities that come to constitute self-concept (often called a *representational repertoire*) must be derived not only from the social representations that are available and understood within one's overall cultural group, however, but also from those representations that are specifically interpreted as *possible* for the individual. Thus, culturally transmitted information relayed to individuals regarding their positioning in the larger social context (based on prevalent cultural imagery, role models, imparted knowledge, interpersonal interactions, etc.) serves to determine (and limit) the possible identities and opportunities that both they and others can imagine as available to them for inclusion within their representational repertoires (Fryberg & Markus, 2004; Oyerman & Markus, 1990; Zirkel, 2002). More specifically, cultural information related to social

categorization (e.g., social group belonging based on race/ethnicity, sex, socioeconomic status, sexual orientation, religious affiliation, etc.) is heavily influential in determining which social representations are considered possible and relevant in conceptualizations of self-identity. And as the available social representations and social domains of relevance for different social groups vary in terms of both quality and quantity, the representational repertoire range for members of these groups is similarly varied (Fryberg & Markus, 2004; Fryberg et al., 2008).

Those who are categorized as “universal subjects” based on their membership status to exclusively majority social groups are depicted as the default or “normal” representation of personhood, as well as the standard representational figure across a broad range of more specific domains and contexts in a given society. In other words, these members of the “referent ethnicclass” (in North America considered to be those who are white, Christian, middle-class, heterosexual, cisgendered, and male) are afforded a wide and nuanced range of representations of their social group. With their members commonly represented and relevant in a general cultural context and across many assorted social roles and domains, they have the opportunity to choose from a similarly wide array of potential available identities in constructing their representational repertoires (Franklin & Boyd-Franklin, 2000; Fryberg et al., 2008; Fryberg & Townsend, 2008). In contrast, those social groups without majority status are afforded more limited, often negative or socially devalued representations, while some go almost entirely unrepresented in the collective culture. The lack of social representations of these marginalized social groups serves to confine their group members in the available possible identities they can potentially assume or imagine for themselves, as well as to render them irrelevant to any social roles

or domains outside of their constrained representational repertoires (Franklin & Boyd-Franklin, 2000; Fryberg & Markus, 2004; Fryberg et al., 2008; Fryberg & Townsend, 2008).

The socially and financially valued field of science, for example, is one in which women and certain ethnic minorities are underrepresented in comparison to white men, both in reality (i.e., in jobs, college majors and coursework) and media depictions. Research on children's internalized conceptions of scientists (mental schemata influenced and reinforced by historical and media representations) reveals a corresponding lack of female and minority relevance in science-related domains. While children typically draw images of their same sex and race when asked only to draw a "person," the same does not hold true once they are asked to draw or describe a person belonging to the male dominated domain of science. Children in grades 4-8 are instead significantly more likely to depict male scientists, and some studies show a tendency toward drawing images of Caucasian over black or Hispanic scientists as well. While white male students were most likely to depict a "stereotypical" scientist, the large majority of female and ethnic minority students represented the typical scientist as white and male as well (Finson, 2002; Finson, 2003; Huber & Burton, 1995; Steinke et al., 2007).

However, as these conceptions of scientists are influenced by exposure to representations of scientists, interventions that exposed children to a female scientist role model did, in fact, make them more likely to draw female scientists (Finson, 2002). Unfortunately, the more typical lack of gender- and race-matched role models in science (along with other academic and career-related fields) is cited as limiting female and minority students ability to imagine themselves as scientists as well; in other words, they may interpret the lack of exposure to their own social groups' representations in the field

of science as limiting their own potential representational repertoires and understood relevance in the domain of science (Finson, 2002; Fryberg & Townsend, 2008; Zirkel, 2002).

Similarly constrained representations of women and ethnic minorities can be found more broadly through various media depictions as well. In the growing market of video games, for example, primary playable characters are almost always male. Even an inclusion of secondary characters in a demographic analysis of video game characters shows that about 85% of video game characters are male while only about 15% are female (Williams, Martins, Consalvo, & Ivory, 2009), and that most of these female characters are portrayed in secondary, nonessential, passive, stereotypic, and/or sexualized roles (Burgess, Stermer, & Burgess, 2007; Ivory, 2006; Williams et al., 2009). Additionally, whites and Asians are overrepresented as both primary and secondary video game characters, while other ethnic minority groups (i.e., Hispanic, black, biracial, and Native American) are underrepresented in comparison to actual demographic distributions (Williams et al., 2009). These disparities persist even though they do not reflect the reduced gender discrepancy amongst actual gamers, and despite the fact that underrepresented minorities play video games at the same (if not higher) rates as more represented ethnic groups (Burgess et al., 2007; Ivory, 2006; Williams et al., 2009). This same trend is maintained consistently across other forms as media as well, in which whites and males are substantially overrepresented in media domains such as prime time television (Harwood & Anderson, 2002) and even children's literature (Cooperative Children's Book Center, 2012; Gooden & Gooden, 2001).

The (over-)representation and thereby normalized relevance of the universal subject in most domains (especially those with higher social status/esteem) assures him “social visibility,”¹ or noticeability through ideas, values, beliefs, voice, etc., as these assertions of public social, cultural, and political presence are perceived as contextually relevant. Meanwhile, across the wide array of social domains in which they are un(der)represented, marginalized group members are categorically defined as lacking relevance, thereby denying them wider social noticeability (as their ideas, values, beliefs, etc. are perceived as irrelevant based on their corresponding irrelevance to the social context more generally). Consequentially, while the universal subject is by default granted access to broad social legitimacy and visibility, minority group members must vie with each other for any remaining available identities within those contexts that will allow them to gain the social acceptance, inclusion, validation, acknowledgment, visibility, and legitimization that they are generally denied in a larger social context and can only gain access to on conditional terms (Franklin, 1999; Franklin & Boyd-Franklin, 2000; Fryberg et al., 2008; Fryberg & Townsend, 2008; Markus & Nurius, 1986; Markus, Steele, & Steele, 2000).

For example, a study conducted by Eberhardt, Goff, and Davis (2004) examined which social groups are considered relevant and therefore worthy of attention based on subjects’ visual tuning (i.e., toward which stimuli subjects directed their gaze and thereby attention). The researchers found that participants focused their gaze more on white male

¹ Here it is important to note the distinction between *social* and *physical* visibility: *social visibility* is noticeability through ideas, voice, and other assertions of public social, cultural, and/or political presence, while *physical visibility* is noticeability exclusively through physical presence. In order to avoid confusion, throughout the rest of this paper the term “social visibility” will be replaced with social relevance and social noticeability.

faces in a neutral context (i.e., general social context), but focused more on black male faces in a crime context. Thus, while white men are generally more relevant and therefore more noticeable to others, black men become relevant and more noticeable only within certain limited contexts, in this case based on the association between black men and crime that makes them attentionally relevant and visible within a related context.

Public versus Private: Conditions of Female Social Relevance

If the universal subject is gendered male, then it follows that women, by comparison, are granted less social visibility. Previous research (cited above) has shown, for example, that they are considered less relevant in STEM domains and are largely underrepresented throughout many types of media. However, just as black men are considered contextually relevant in the domain of crime despite their lack of general social relevance, women may have representational repertoires consisting of domains in which they are similarly considered more relevant. We can therefore ask: In which social domain(s) or context(s) are women represented and of primary relevance?

This question has been addressed by feminist historians through the “separate spheres” theory, an ideology at least as old as Aristotle that defines human civilization as split between the public sphere and the private sphere. The private sphere (labeled *oikos*, ancient Greek for household/family, by Aristotle) is constrained strictly to domesticity, which relates primarily to family, intimacy/relationships, reproduction, nurturance, and other matters of biological necessity. The rest of society, meanwhile, is relegated to the public sphere (labeled *polis*, ancient Greek for city, by Aristotle), which relates to extrafamilial society, market economy, culture, production/”real” work, and politics. In

contrast to the private sphere, which is the realm of personal life and thereby that which is hidden, sheltered, withdrawn, invisible, and inaudible to others, the public sphere definitionally includes that which is open, revealed, accessible, visible, audible, and influential on *both* spheres (Klein, 1995; Prokhovnik, 1998; Vickery, 1993; Weintraub, 1997).

The demarcation of the boundaries between public and private thereby also defines the classic mind/body split of Cartesian dualism, in which the mind (the soul, spirit, creativity, intellect, and/or thought) is considered distinct and separate from the body (the material and physical). In this way, the sphere of the superior *mind* is a public one, through agentic influence on and visibility in social, cultural, economic, and political realms. Meanwhile, the inferior *body* is typically relegated to the private/domestic sphere with passive influence through primarily relational means and solely physical visibility in public (Bordo, 1993; Klein, 1995).

Importantly, the parallel dichotomies of public/private and mind/body classically fall along gendered lines. *Women* are considered more closely connected to domesticity (i.e., *the private sphere*) and physicality (i.e., *the body*), while *men* have domain over civil society (i.e., *the public sphere*) and mentality (i.e., *the mind*). This dichotomy between home and the rest of the world (as well as its relationship to the mind/body dichotomy) structured much of the work and lives of American men and women (especially and primarily those belonging to the middle class) from the 19th century until the mid- to late-1980s (Bordo, 1993; Elshtain, 1981; Klein, 1995; Vickery, 1993). However, throughout much of the 20th century women began moving into the public sphere, starting with

political changes such as the right to vote, a movement into the workforce during World War II, and the Equal Pay Act (Vickery, 1993; Prokhovnik, 1998).

Despite this shift of female movement into the public sphere, it is possible that women are still limited in relevance based on representational repertoires that are centered around *private* contexts. In other words, we question the specific *public* domains in which women gain their social relevance and thereby noticeability and audibility. As the private is related to that of the body, we propose that it is strictly through their *physical* appearance that women gain relevance in the public realm, while they are largely denied wider social and cultural relevance.² In other words, women are “*culturally invisible* while being *physically visible*” (Tseëlon, 1991, p. 111), allowed relevance and social value through their bodily physicality while simultaneously lacking any real social or cultural influence. Women’s bodies are therefore viewed as representative and of focal importance at the expense of their minds, personhoods, and voices. Thus, when women are represented in the public realm, it is through their *physical visibility* as opposed to their *cultural audibility*. And with appearance rather than goal-oriented activity serving as the primary source of female social influence, “attracting becomes a substitute for acting” (Freedman, 1986, p. 72), such that women can only become noticeable by literally being *seen* rather than by

² We will not address here the relevance women gain through other areas related to the private sphere, namely those involving nurturing and other relationship-oriented activities and influence. However, other authors and researchers have addressed the potentiality of women’s representational repertoires in public as including these private-related domains. For example, while women have indeed joined the workforce, they tend to be under-represented in top jobs and esteemed fields (e.g., STEM fields) and take a greater proportion of poorly paid and/or part-time work (Finson, 2002; Prokhovnik, 1998). Additionally, even within professional contexts they tend to hold positions that put them in stereotypically feminine roles of support and nurturing; for example, the 2012 survey by the U.S. Department of Labor found that the leading occupations for employed women included secretaries/administrative assistants, elementary and middle school teachers, nurses, maids and housekeepers, childcare workers, receptionists, etc.

being socially or culturally audible, by being decorative objects rather than agentic subjects (Bartky, 1990; Eberhardt et al., 2004; Freedman, 1986; Heflick, Goldenberg, Cooper, & Puvia, 2010; Kaschak, 1992; Rubin, Newmeroff, & Russo, 2004; Tseëlon, 1991; Tseëlon, 1992; Schur, 1983; Weitz, 2001; Wolf, 1990).

The gendered bias in determining what information considered relevant, informative, and representational of men compared to women is demonstrated in the research and literature on sexual orientation labeling. Specifically, such research shows that while male sexual orientation is evaluated based on what men *do* and *say* (i.e., male sexual orientation is labeled based on men's personality, interests, actions, behaviors, character traits, and vocal patterns), female sexual orientation is evaluated primarily based on how women *look* (i.e., female sexual orientation is labeled based on appearance standards such as attractiveness, clothing/makeup/ jewelry, hairstyle, and body shape). Consistent with other research (see *Fig. 1 and 2*), we found across a series of sexual orientation labeling studies that while male sexuality is judged based on self-descriptions of behavior and personhood, as well as through vocal patterns (specifically, with men with less stereotypically masculine self-descriptions and vocal patterns being more likely to be labeled as homosexual), the same indicators are interpreted as implying nothing about female sexuality (Deaux & Lewis, 1984; Faraday, 1981; Johnson, Gill, Reichman, & Tassinari, 2007; Kite & Deaux, 1987; Kulick, 2000; LaMar & Kite, 1998; McCreary, 1994; Moonwomon-Baird, 1997; Munson, McDonald, DeBoe, & White, 2006; Sanchez, Crocker, & Boike, 2005; Zwicky, 1997). Instead, the most consistent patterns in the labeling of female sexuality emerge in relation to appearance, primarily with less attractive and/or more masculine-*looking* women being more likely to be labeled as homosexual (Ambady,

Hallahan, & Conner, 1999; Beren, Hayden, Wilfley, & Strigel-Moore, 1997; Dew, 1985; Johnson et al., 2007; Kite & Deaux, 1987; Pitman, 1999; Rothblum, 1994; Rudman & Fairchild, 2007; Rule, Ambady, & Hallett, 2009; Unger & Crawford, 1992; Unger, Hilderbrand, & Madar, 1982; Zipkin, 1999). This gendered difference in the types of information used in sexual orientation labeling has even led to a bias in the studies conducted in relation to male and female sexualities—the majority of research focuses on male sexual orientation labeling, with the exception to this trend limited to the realm of appearance and labeling, in which female sexuality is given preference.

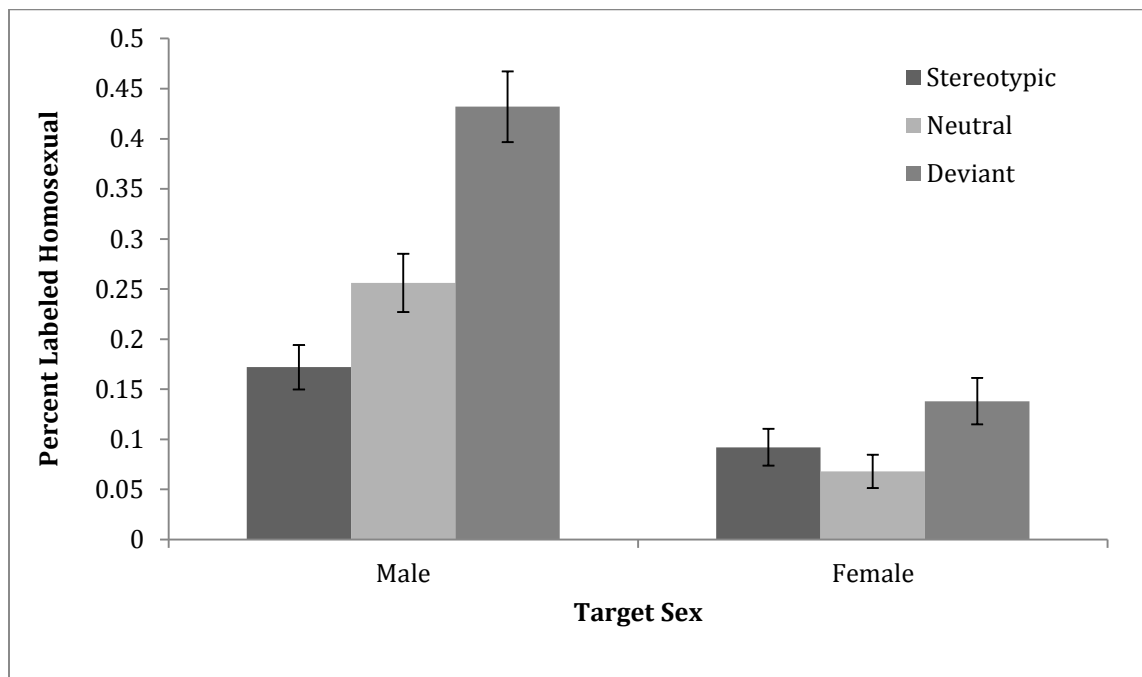


Figure 1. Sexual orientation labeling based on target behaviors and personal character (as expressed through verbal content of targets' statements; $N=49$). Error bars are standard error.

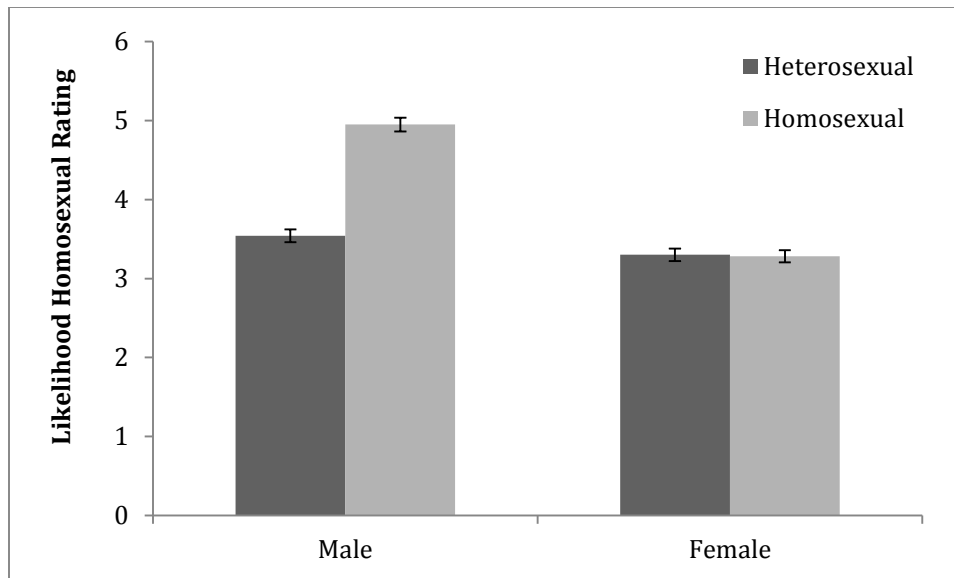


Figure 2. Sexual orientation labeling based on target vocal patterns (with higher ratings indicating greater likelihood of homosexuality; $N=84$). Error bars are standard error.

The (under-)representation of women in mainstream media is another descriptive example of the way in which women's relevance in a public domain is restricted to their bodies. First, women were found to be largely underrepresented in Hollywood movies; for example, only 10.7% of movies featured gender-balanced casts. However, even when women *are* represented in these movies, it is primarily through their physical visibility as opposed to their audibility; for example, only 30.8% of *speaking* characters in movies are women. And importantly, the conditions of female physical visibility centered around their bodies rather than any other sort of presence; for example, 28.8% of female characters wear sexually revealing clothing (compared to only 7.0% of male characters), and even of those female characters with dialogue, about 1/3 of them were shown in sexually revealing attire or as partially naked (New York Film Academy, 2013).

This type of limited representation of women as physical bodies to be consumed and evaluated by others occurs in public domains beyond just that of mainstream media,

however. This phenomenon is commonly known as sexual objectification, through which a woman's body becomes representative of her identity and she is reduced from a complete human being to an object, with her physical appearance used as the primary determinant of her worth. Though there is some evidence that the objectification of men is becoming more mainstream (e.g., Loughnan et al., 2010; Rohlinger, 2002), most research shows that it is usually women who are objectified in the media and by others, viewed as aesthetic, erotic objects that exist for public consumption (Bernard, Gervais, Allen, Campomizzi, & Klein, 2010; Brown, 1998; Cikara, Eberhardt, & Fiske, 2010; Fredrickson & Roberts, 1997; Freedman, 1986; Hatton & Trautner, 2001; Heflick et al., 2020; MacKinnon, 1989; McKinley & Hyde, 1996; Moradi & Huang, 2008; Muehlenkamp & Saris-Bahlama, 2002; Rubin et al., 2004; Schur, 1983; van Zoonen, 1994). Not only are women more likely to report experiences of sexual objectification (Moradi & Huang, 2008; Swim, Hyers, Cohen, & Ferguson, 2001), but they are actually more likely to be objectified by both male and female observers (e.g., Strelan & Hargreaves, 2005) and to experience sexual harassment in relation to their appearance (Bartky, 1990; Freedman, 1986; Gardner, 1980; Greenleaf, 2005; MacKinnon, 1989; McKinley & Hyde, 1996; Muehlenkamp & Saris-Bahlama, 2002; Schur, 1983). Further, depictions of women (especially in mainstream media) are more frequently and intensely sexualized than those of men. For example, Hatton and Trautner (2011) found in a survey of *Rolling Stone* magazines over a 40-year time period (1967-2009) that only women were hypersexualized on the magazine's covers, and that they were much more likely to be sexualized and undressed than men in their representations.

With women so frequently represented through their physicality and a simultaneous lack of audibility, perceptions of women and their relevance in the public

sphere consequentially become related to that of visible objects rather than agentic subjects with voice. Specifically, sexual objectification has been found to literally lead to the perception and treatment of women as objects rather than as fully human subjects, while sexually objectified men are still largely perceived as being agents. Multiple studies have shown that sexualized women are recognized in the same way that objects are, while sexualized men are still viewed as persons on basic neural and cognitive levels. For example, increased memory for sexualized female bodies is correlated with increased activation of neural networks associated with manipulable objects and decreased activation of brain regions associated with social cognition and mentalizing (Cikara et al., 2010; Fiske, 2009). These sexualized women were also rated as having the least amount of agency and control over their lives (as compared to fully-clothed female, fully-clothed male, and sexualized male targets), and on an IAT were more easily associated with first-person verbs (as they are the objects of the participants' own actions) while control women were more easily associated with third-person verbs (as they are the agents responsible for their own actions) by men with high hostile sexism scores (Cikara et al., 2010). Additionally, a study conducted by Bernard and colleagues (2010) demonstrated that sexualized female bodies are equally recognizable when presented upright or inverted (object-like recognition), whereas male bodies are better recognized when upright rather than inverted (person-like recognition). Thus, women are not only more likely to be represented through their physicality rather than their audibility; rather, these physical representations are also more likely to make them relevant as strictly physical (and often eroticized) bodies, but potentially less relevant as audible and agentic subjects/minds in the public sphere, while the same is not true for men.

Researching Relevance

While previous research has demonstrated the prevalence of female representation through the body as opposed to the mind, there has not been any research that has more directly probed at the effects of these representational tendencies on women's *relevance* in the public sphere. Based on other research on social relevance and its relationship to social representation(s), it stands that if women are more commonly represented as bodies (i.e., as physical and often eroticized objects) as opposed to minds (i.e., agentic and audible subjects), then they should also gain more social relevance in contexts of physical visibility as opposed to ones of social audibility. Further, they stand to lose relevance when audibility—an area outside of their representational repertoires—is added to that of their physical visibility. In other words, just as we saw that black men lost relevance in a general social context as opposed to one specifically related to their representational repertoires, women will lose relevance in contexts that extend beyond their representational repertoires of physicality. Thus, we propose that, in a public context, women have physical relevance (passive, appearance-based influence through the body) at the expense of social audibility and relevance (agentic, voice-based influence through the mind). In order to study this hypothesis, however, we must first consider how best to examine the concept of “relevance” it relates to attentional directing and cognitive processing.

Relevance and Visual Attention

Attention is allocated selectively and strategically in order to parse down the superfluous number of potential stimuli in a given environment to more manageable amounts of adaptively relevant information available for further cognitive processing. As a

variety of eye tracking studies have demonstrated, visual attention in particular is closely associated with attentional focus. The selective directing of visual attention therefore similarly shows a bias toward stimuli considered *relevant* to the perceiver, with relevance decided by aspects such as past experiences/memory, behavioral necessity, evolutionary importance, pre-established schemata, current/induced mood, and stable personal traits (Chun & Turk-Browne, 2007; Isaacowitz, 2005; Jiang & Chun, 2001; Kellough, Beevers, Ellis, & Wells, 2008; Mogg, Millar, & Bradley, 2000; Wadlinger & Isaacowitz, 2006; Wells, Beevers, Robinson, & Ellis, 2010).

Often stimuli relevance is consistent across the majority of population. For example, as social beings people of all ages automatically focus visual attention towards humans and human faces (especially the face's more socially relevant features, such as the eyes and mouth) above and before other (especially inanimate) aspects of their environment. However, this attentional bias in gaze directing is altered by non-typical social development. In patients diagnosed with autism (a disorder characterized by impaired social functioning and communication) compared to typically developing individuals there is decreased visual fixation on human figures and faces, especially in relation to the mouth and eye regions. Further, autistic patients show a positive relationship between social adaption and visual attentional directing towards humans, as well as a negative relationship between social impairment and visual directing towards humans (Klin, Jones, Schultz, Volkmar, & Cohen, 2002; Riby & Hancock, 2009). In contrast, patients diagnosed with Williams Syndrome (a disorder characterized in part by what is described as "hyper-sociality" or a "pro-social compulsion") there has been found to be increased fixation of

faces, especially in relation to the eyes of others, as compared to visual fixation patterns of typically developing individuals (Riby & Hancock, 2009).

The importance of human faces also leads to differences in the specific attentional biases found in relation to looking at different types of faces. Increased visual attendance is given to high status persons compared to low or equal status persons, particularly during speech (Dovidio & Ellyson, 1982). In patients with social phobia and generalized anxiety disorder, there is hyper-attention to social threat cues, with these patients looking more immediately towards threatening (i.e., angry) rather than neutral facial expressions compared with normal controls. However, despite their tendency to orient their visual attention toward threatening faces, they show an increased avoidance of eyes, particularly on angry faces, even though control subjects show increased fixation on the eyes of angry faces (Mogg et al., 2000; Williams, Gonsalvez, & Gordon, 2004). Similarly, dysphoric and depressed individuals are also on alert for signs of interpersonal rejection, and therefore show increased visual fixation on angry faces (i.e., faces that signal interpersonal rejection and are therefore of particular salience and relevance) than nondysphoric individuals (Wells et al., 2010). Further, they also show a visual attentional bias toward sad facial expressions, with increased visual fixation on sad faces compared to their non-depressed counterparts (Kellough et al., 2008).

Depressed and dysphoric individuals selectively allocate visual attention to negative over positive stimuli across domains beyond facial expressions as well. They maintain gaze longer on and attend more frequently to dysphoric stimuli (e.g., words and images) than do nondysphoric controls. In contrast, these never-depressed participants actually spend more time visually attending to positive (as well as neutral) stimuli, a protective attentional

bias that allows for processing of less negative and more positive information (Caseras, Garner, Bradley, & Mogg, 2007; Ellis, Beevers, & Wells, 2011; Kellough et al., 2008). This protective bias is especially true of optimists, who show selective inattention to negative imagery (Isaacowitz, 2005). Even less permanent affective states influence attentional biases, with participants who have been induced with a positive mood showing more visual fixation on peripheral, highly-valenced positive stimuli than control subjects (Wadlinger & Isaacowitz, 2006).

The relevance of stimuli in an environment for perceivers can be altered based not only affective states but also in accordance to spoken language. An eye tracking study conducted by Tanenhaus, Spivey-Knowlton, Eberhard, and Sedivy (1995) found that participants made eye movements towards objects immediately after hearing relevant words in spoken instructions that related to those objects. For example, a set of verbal instructions asking participants to touch one of four blocks that varied in terms of marking, color, and/or shape led to eye movements towards the target block immediately following the end of a word that uniquely specified the target with respect to the visual alternatives (e.g., looking after the word “starred” in the instructions if only a single target block was starred, or looking after the word “square” in the same set of instructions if there were two starred blocks but only one which was square, etc.). With more complex instructions, series of eye movements occurred in close succession to the words in the instructions that were relevant for establishing reference. Thus, participants demonstrated a tendency to selectively attend to relevant visual stimuli in relation to online linguistic input.

Perhaps most relevant is the study conducted by Eberhardt, Goff, and Davis (2004) examining social group relevance based on similar eye tracking methodology. As

mentioned previously, results showed a bias toward visual fixation on white over black male faces when the context was neutral, indicating that that these so-called universal subjects were more attentionally relevant to participants in a general social context. However, in a context in which black men are generally stereotyped as being more relevant—that of crime—participants showed greater attentional directing toward black male faces. In sum, participants directed their visual attention toward members of a given social group considered relevant in a given context; as white men are generally speaking more socially relevant they receive more visual attention when no specific social context was given, except in the context of crime, which is considered to be part of black men’s representational repertoire.

Previously, we proposed that physicality, or appearance-based relevance, was part of *women’s* representational repertoires. Some research on attentional biases in visual directing lends support for this hypothesis, with women often described as *hyper*-visible in that they command more attention from and are considered more desirable as the objects of the gazes of both men and women alike (e.g., Eck, 2003; Fredrickson & Roberts, 1997; Hall, 1984). Women are more likely to feel observed during interpersonal encounters (Argyle & Williams, 1969), and are more likely to actually be the objects of external, often non-reciprocated gazes (Hall, 1984).

However, it is important to examine not only whether or not women have increased physical relevance, but also if this physical visibility is part of women’s relevance and representational repertoires while audibility is not. In order to examine this possibility, it is necessary to track attentional directing through gaze not only in physical contexts (as has been done in previous research), but also in domains that extend beyond those relating

exclusively to physicality. Here, we expect to find that women should show not only increased relevance in physical domains, but also that they should show decreased relevance with the inclusion of audibility—a domain that extends beyond that of their representational repertoires. Meanwhile, as universal subjects white men should continue remain relevant even once audibility is added to physicality in terms of contextual public relevance.

Relevance and Memory

As discussed above, attention and memory are interconnected processes, with memory guiding attention selectively toward stimuli that are of adaptive relevance and importance. Yet this relationship of influence is not unidirectional but instead reciprocal, and conversely attention is necessary to the operation of memory as well as vice versa. As memory has limited capacity, attention is used to selectively determine which information will be prioritized in allocating processing resources, such that attentionally relevant input will be more likely to influence behavior, be encoded to memory, and/or allow implicit and explicit learning. Attention therefore functions as a type of gatekeeper to memory, governing which information will be encoded and represented in conscious memories. Further, attentional focus has been found to enhance memory encoding, increasing the likelihood of subsequent conscious awareness and recall (Chun & Turk-Browne, 2007; Jiang & Chun, 2001; Lamme, 2003; Wells et al., 2010).

The contribution of biases in attentional directing to related biases in recognition and recall has been found across a variety of domains. In the research on clinical depression and dysphoria discussed previously, for example, clinically depressed and

dysphoric patients were found to have attentional biases toward negative stimuli and away from positive stimuli compared to never-depressed control participants. This pattern of negative attentional focus relates to similarly biased memory processes, such that depressed and dysphoric patients tend to over-recall negative information and under-recall positive information (Bradley, Mogg, & Williams, 1995; Ellis et al., 2001; Wells et al., 2010). The same has been found for chronic pain patients, who show selective attention as well as recall for sensory adjectives directly related to pain (Edwards, Pearce, Collett, & Pugh, 1992). Additionally, only selectively attended to aspects of stimuli consisting of composite images of faces and scenes are subsequently remembered (Chun & Turk-Browne, 2007), and implicit learning of complex visual configurations is similarly related to attentional focus (Jiang & Chun, 2001).

However, attentional resources are necessary but not sufficient for memory encoding; attention is not equivalent to awareness, and instead attended stimuli are not always processed beyond a sensory to a perceptual stage unless they are considered to have further relevance, thereby filtering out any irrelevant information before it reaches awareness (Chun & Turk-Browne, 2007; Jiang & Chun, 2001; Lamme, 2003). Even fully attended and visible stimuli are therefore not always consciously perceived (Lamme, 2003). And while research on patients with depression demonstrates both increased attendance and memory for mood-congruent stimuli, patients with generalized anxiety show only early and automatic attentional biases for anxiety-related stimuli that do not reflect any subsequent increased elaboration, processing, or memory for anxiety information *in general*. Instead, anxiety patients demonstrate memory biases restricted exclusively to materials relevant to their own current and personal anxiety-related

concerns, a cognitive bias that is proposed to have its roots in the function of anxiety as related to detecting and dealing with threats immediately but not necessarily with further processing of threat-related information if it is not perceived to have any direct relevance or impact (Bradley et al., 1995; MacLeod & Rutherford, 1992; Rinck & Becker, 2005).

Conversely, there is also a memory bias for *others* based on their relevance to any given domain, seemingly regardless of attentional focus. For example, racial and gender schemata enhance memory for perceived persons in roles in which they are considered stereotypically relevant based on their social group membership (Gibbons, Vogl, & Grimes, 2003; Marsh, Cook, & Hicks, 2006; Meiser & Bröder, 2002; Taylor, Fiske, Etcoff, & Ruderman, 1978). Source attribution in particular is affected by these social stereotypes, leading to statements (Marsh et al., 2006) and social roles (Gibbons et al., 2003) being more often attributed to a stereotypically congruent source, such as when stereotypically masculine statements or roles are more frequently correctly attributed to a male source and less frequently correctly attributed to a female source, while the reverse is true for statements or roles considered stereotypically feminine.

Thus, while examining selective attention can reveal early sensory biases for relevant stimuli, biases in *memory* reflect informational relevance based on further cognitive processing and elaboration at a perceptual level, both independently of and as influenced by attention. Past research has even demonstrated that memory for others (including their statements, behaviors, traits, etc.) is influenced by their social group membership, such that memory tends to conform to stereotypes held in regards to contextual and role-related relevance. Our proposal that gendered social schemata ascribe increased contextual public relevance to men over women in the domain of audibility

should therefore be reflected in similarly increased recall for men as compared to women as audible subjects, regardless of visual attentional directing.

Introduction to Study 1: Relevance Determined through Attention and Memory

Attentional Relevance through Eye Tracking

We propose that women gain public relevance through their *physicality* alone (i.e., social representation and relevance through the *body*) but lose this relevance once the context shifts to that of *audibility* (i.e., social representation and relevance through assertion of the *mind* via voice), while men have more universal relevance in the public sphere. Like other research demonstrating the relationship between stimuli relevance and attentional directing, we will also employ eye tracking to explore female versus male relevance across contexts. Based on our hypothesis and previous research on female hyper-visibility, we predict that women should have increased relevance (as determined through increased visual fixation) compared to men when the public context consists strictly of passive physical presence. However, once contextual audibility is added to that of physicality, we should see a shift in attention *away* from women, while male universal relevance in the public sphere should allow the maintenance of attention directed toward men.

In order to create these two contexts (physical visibility and social audibility + physical visibility), we employ a paradigm similar to the social visibility study determining the contextual relevance of black as compared to white men (Eberhardt et al., 2004). A physical context will consist of still photographs of female and male faces, in a similar fashion to the aforementioned study. In order to create a context of social audibility in

addition to that of physicality, we will have an off-screen interviewer pose questions to the people featured in the target photographs. The pause between each question and answers given in response to those questions is a context of audibility in that we expect people to direct their attention more toward those considered *relevant* in answering a question (i.e., those considered relevant in asserting audibility). However, as a context of physicality is necessarily impossible to extract from this context of audibility, we must compare post-question gaze directing to that occurring during physical presence alone. This is where we expect to find a shift in attention *away* from women but not from men.

Finally, we can also look at visual fixation during answers to the questions themselves, exploring perceiver attendance to speakers while they are indicated as speakers/speaking. It is possible that this is similarly a context of audibility, as it involves an actual assertion of mind through speech on the part of the targets. However, as other research on gaze directing has found that perceivers also attend more to stimuli that are unexpected, surprising, and not predicted (e.g., Itti & Baldi, 2009; Wills, Lavric, Crosft, & Hodgson, 2007), it is also possible that increased gaze towards speakers during their statements indicates instead that their speech was more *unexpected* rather than considered more *relevant* of attention.

Post-Task Stimuli Memory

In order to explore these two contradictory hypotheses, we must also examine the *actual audibility* of the speech of differently gendered speakers as well, addressed through perceivers' subsequent *processing* of attended information by testing their recall ability for male and female speech. Specifically, we look at two aspects of memory. The first is

recognition memory for items or facts (Banks, 2000; Meiser & Bröder, 2002), in this case involving perceiver accuracy in discriminating between statements that were heard previously and those that were not. While we might predict enhanced memory for women's statements based on the increased attentional focus given to women while speaking, this will only be the case if women gain their increased attentional relevance through their speech itself. If instead the increased visual attendance directed toward female speakers is due to surprise at their speech (due to its incongruence with stereotypic gender expectations) rather than because of its increased audibility (i.e., the perceived relevance of the actual *content* of their speech), increased attendance should be limited to the sensory stage without extending to subsequent perceptual processing. Thus, despite increased visual attendance during women's speech it will not be more extensively processed, leading to no difference in or even decreased recognition of statements made by women as compared to those made by men.

However, other research (including our own) demonstrates consistently high levels of accuracy on this type of recognition memory task (e.g., Senkfor & van Petten, 1998; Taylor et al., 1978), which may lead to a ceiling effect in participants' recall for all previously heard statements. We therefore will additionally examine participants' *source memory* for the contextual information related to the origin of encoded items or facts (Banks, 2000; Meiser & Bröder, 2002), in this case involving perceiver accuracy in discrimination between a limited and known pool of potential sources of previously heard statements (i.e., accuracy in locating speakers in relation to the statements they made). Source attribution memory and item recognition memory have been consistently found to function independently of each other (Banks, 2000; Batchner & Reifer, 1990; Meiser &

Bröder, 2002), with source attribution often proving to be more difficult than item recognition based on its comparatively decreased rates of accuracy for memory of both visual and auditory input (Banks, 2000; Taylor et al., 1978). More important than its increased difficulty, though, is the capacity for source memory to probe at perceivers' recall for male and female speakers *as audible subjects*. We believe that it is not necessarily that women's statements are not *heard* (such that perceivers will recall statements made by men and women at equivalent rates), but rather that the contents of female voice and female assertions of audibility are less likely to be attributed to the women themselves (Sesko & Biernat, 2009). There are thus two possible alternative outcomes in relation to source attribution memory:

1. Greater visual fixation on women as compared to men during their speech can be attributed to actual increased attendance to women as audible subjects, and will therefore result in increased accuracy in source attributions made for women's as compared to men's statements (i.e., increased memory for women as audible subjects).
2. Greater visual fixation on women as compared to men during their speech can alternatively be attributed to the surprise that arises when women contradict expectations and speak instead of men. Therefore despite the increased visual attendance accorded to female speakers, there will not actually be greater attendance or processing to female sources of speech, and instead there will be either equivalent or even decreased accuracy in source attributions made for women's as compared to men's statements (i.e., decreased memory for women as audible subjects).

Further, in order to ascertain that target sex is in fact a salient social group categorizer used in the encoding and processing of information about the targets and what they say, we will also examine to whom statements were misattributed. Thus, we predict that based on the salience of gender as a means of organizing information when perceiving others, we should find that participants may recall the gender of the speaker making the statement even if they do not necessarily recall the correct speaker. In other words, we predict that participants will be more likely to misattribute speaker statements to an incorrect but gender-congruent speaker than to an incorrect speaker of the opposite sex, with statements made by female speakers being more likely to be misattributed to another female speaker and statements made by male speakers being more likely to be misattributed to another male speaker (Sesko & Biernat, 2009; Taylor et al., 1978).

Relationship between Attention and Memory

Additionally, it is important to probe more directly any potential relationship between visual attendance to speakers and subsequent memory for those speakers as audible subjects (i.e., subsequent accuracy in source recall for those speakers' statements). As we believe that people perceive of women as more relevant in a physical capacity (i.e., women are relevant based on how they *look*) but perceive of men as more relevant in an audibility capacity (i.e., men are relevant based on what they *say*), we should find that the visual attention granted to speakers should relate to further cognitive processing of those speakers only within domains considered relevant to them based on their gender.

We therefore predict that for men—whose relevance in the public domain related to social audibility—increased visual attention given to them during speech should

correspond with increased memory for them as audible subjects (i.e., increased accuracy in source recall for male speakers). In other words, we predict that for male speakers there will exist the standard positive correlation between attention and memory in the domain of audibility. We predict that the same will not be true for women, however, as their relevance in the public domain relates more exclusively to their physical visibility rather than their social audibility. Instead, visual attention given to female speakers will show no relationship with memory for those female speakers as audible subjects (i.e., accuracy in source recall for female speakers). As such, the standard positive correlation between attention and memory will not be found for women in terms of their audibility, as this is a domain that does not fall within the female representational repertoire.

Study 1 Methods

Participants

Fifty-four Princeton undergraduate students (30 female and 23 male, mean age = 19.37) participated in this study, though 9 participants (5 female and 4 male) were excluded from eye tracking analyses *only* due to technical difficulties with the eye tracker (while all participants were included in the memory portions of analyses). The majority of participants labeled themselves as heterosexual, though 6 participants did not; of these participants, 3 male participants labeled themselves as homosexual, 1 male participant labeled himself as queer, 1 female participant labeled herself as bisexual, and 1 female participant did not disclose her sexual orientation. Additionally, 25 participants described themselves as White or Caucasian, 20 as Asian or Asian American, 4 as mixed race, 2 as Black or African American, 1 as Hispanic or Latino, and 1 participant chose not to respond.

All participants were recruited via SONA, the Princeton subject pool, and received one hour of course credit for their time. Of all the participants, 21 were randomly assigned to Condition 1 and 24 to Condition 2.³

Materials

Auditory stimuli. The recorded script was in an interview format, with a female interviewer posing 13 questions to which there were 32 answers total given (2-4 answers per question; see *Appendix 1* for full script). Of these spoken answers, four were made by each of the 8 interviewed respondents (with 4 male and 4 female respondents), and the same speaker never answered any given question more than once. All of the 8 respondent voices and the interviewer voice were controlled for loudness. Two conditions were used, such that if a female respondent gave an answer in Condition 1, a male respondent gave the same answer in Condition 2, and vice versa (see *Appendix 2*). All 9 speakers were volunteers recruited from Princeton and USC graduate students.

All content in the script related to the gender neutral topic of finding a job after graduation, with the interviewer asking respondents their opinion on finding and interviewing for jobs post-college. Interview answers were modeled after the script used in Sesko and Biernat's (2010) speaker misattribution study, and were controlled for in terms of length (with each answer being about 1-2 short sentences). All interview questions were written to contain gender neutral content except for two control questions, which had stereotypically feminine-typed, appearance-centric content (i.e., Question 6, "Generally speaking, what is appropriate attire for a job interview?" and Question 7, "Have

³ Of participants included in the eye tracking portion of the analyses, 21 were in Condition 1 and 24 were in Condition 2.

you ever had to deal with any sort of sexual harassment during a job interview, and if so, how did you deal with it?”). An independent group of 14 Princeton undergraduates (7 male, 7 female) rated the interview questions for the gendered nature of their content on a Likert scale from 1-7 (with 1 being very masculine, 4 being gender neutral, and 7 being very feminine). These raters reported that overall the questions were gender neutral in content ($M=4.04$, $SD=0.27$), with no difference in terms of gender content scores given by male as compared to female raters ($F(1,13)<1$, $p=.832$). Additionally, ratings of Question 6 ($M=4.38$, $SD=1.08$) and Question 7 ($M=5.57$, $SD=1.28$) were more feminine than gender neutral, (trending toward difference from gender neutrality, $t(13)=1.24$, $p=.239$, and significantly different from gender neutrality, $t(13)=4.58$, $p=.001$, respectively), such that both of these questions were in fact considered feminine-typed by raters, while the other interview questions were not.

Skype movie. The visual screen layout of the movie viewed by participants was formatted using MatLab to resemble a Skype conversational screen, with the video option of Skype turned off (see *Fig. 3*). Thus, representations of the interviewees were portrayed on screen through 8 still face photographs (4 male and 4 female) rather than videos. All of the photographs used to represent the interviewees were taken from the NimStim face set (Tottenham et al., 2009), and were controlled for in terms of age, facial expressiveness, emotionality, attractiveness, clothing, and race (with only white stimulus faces used). Beneath each photograph was the alleged name of each speaker, which was randomly paired with an appropriately sexed face. All photographs were displayed in a random position for each subject (in two rows of four photographs) so as to avoid potential

locational biases, and additionally were randomly paired with a same-sex voice for each subject to avoid potential differences in looking based on speakers' vocal aspects as well.

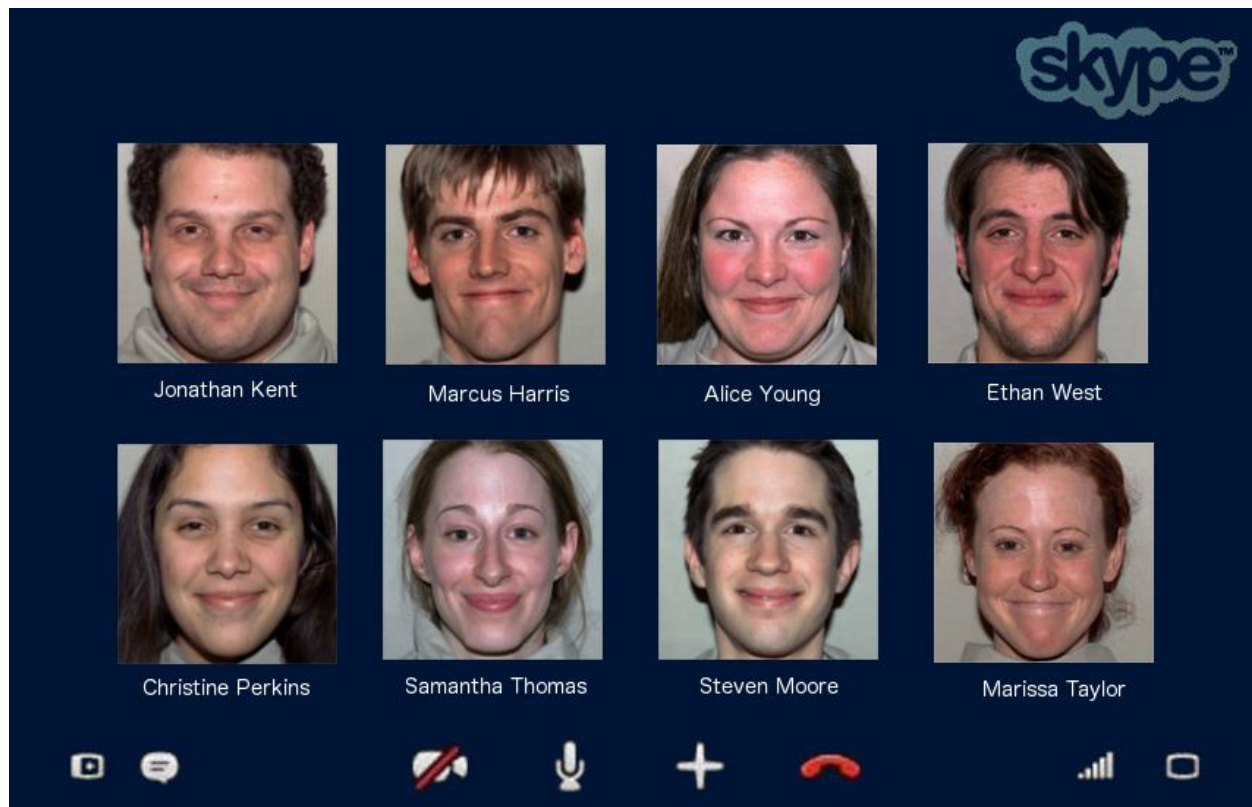


Figure 3. Basic Skype movie screen layout.

The movie was the same for all participants outside of the locations of the photographs of the 8 interviewees. First, the initial viewing screen displayed the basic Skype screen layout with no audio for a total of 4 seconds. Following this, the audio portions of the movie would begin⁴, starting with brief introductions made by all 8 of the interviewees. These introductions were used in order to acclimate participants to the format used throughout the video, in which a blue box appears around one of the 8 onscreen photographs for .7 to indicate the next speaker before s/he actually begins

⁴ Throughout the entirety of the movie, the female interviewer was not displayed onscreen. Instead she, like the participant, inhabited the place of the Skype screen viewer, communicating with the interviewees without being displayed onscreen.

speaking, and then remains in place around the same photograph until that speaker finishes her/his statement (see *Fig. 4*). When all 8 interviewees had introduced themselves there was a 6 second pause, after which the interview portion of the movie began.

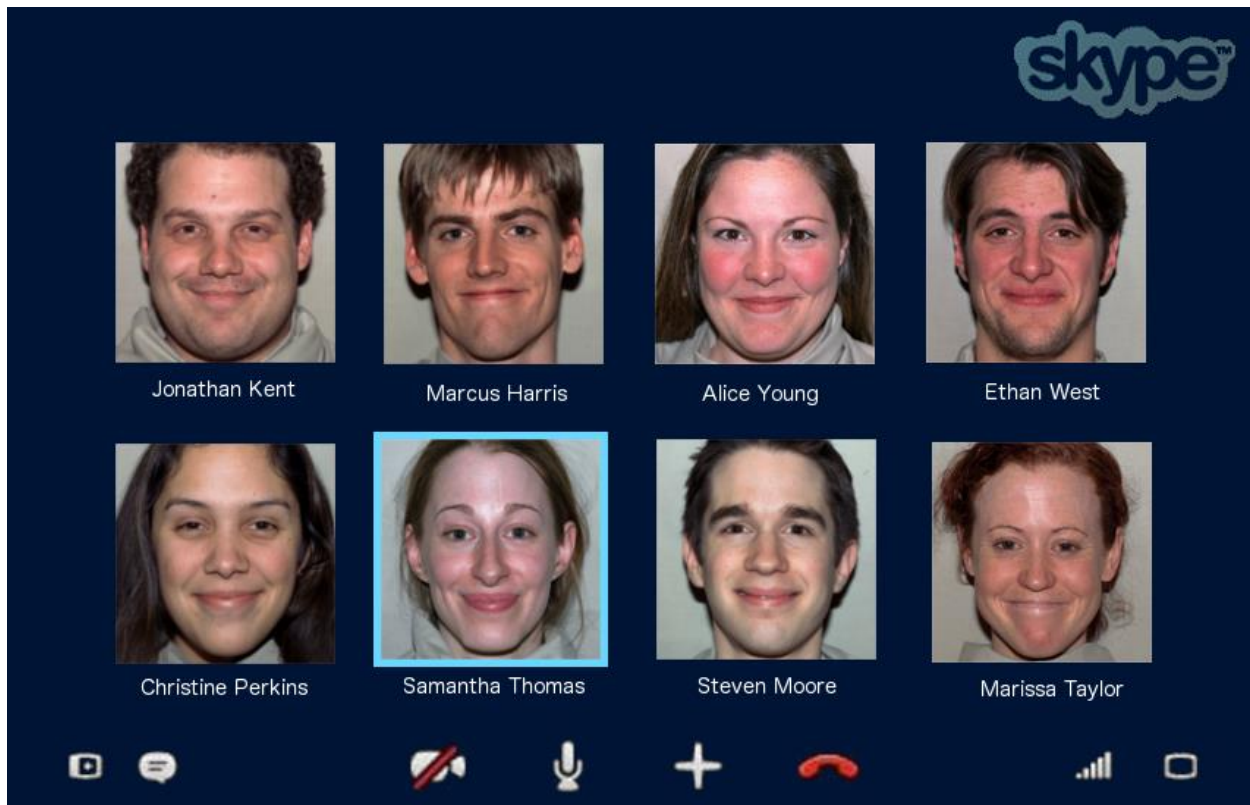


Figure 4. Skype movie screen layout with current speaker indicated.

In this section of the movie, the interviewer first posed the interview question, which was always followed by a 3 second pause. Following the pause, for .7 seconds a blue box would appear around the photograph of the interviewee who would answer the question, and then that speaker gave her/his answer, with the blue box still surrounding her/his photograph until the end of the given statement. A 1 second pause followed this answer, and then the same process was repeated for all interviewees answering the given question (2-4 interviewees per question). A 1.5 second pause followed the last interviewee's answer, after which the interviewer proceeded to the next interview

question, beginning the cycle anew. This process was repeated for all 13 interview questions and their subsequent answers.

Eye tracker. Point of regard (POR) was recorded using the SMI Red500 eye tracker running at 60 Hz. There were three broad categories of potential areas of looking: 1) the Skype background screen; 2) any of the 8 face photographs; and 3) no data (e.g., due to subjects blinking, looking off screen, technical difficulties with the eye tracker, etc.). Participant gaze was recorded at all times during the movie, but certain times were of particular interest. First, POR during the 4-second initial viewing screen was used as a representation of relevance based on exclusively physical presence of the 8 interviewees. Second, POR during the 3-second pause after each question was posed by the interviewer was used as an indicator of expectation of who would have relevance based on audibility *in addition to* physical visibility. Finally, POR during answers to the questions was used as an indicator of attention given to speakers while they were actually asserting their audibility, though the meaning of this attention will be discussed further in Study 1b.

Memory tasks. On the recognition memory task, participants were tested on their recall of randomly displayed written versions of all 32 interview answers heard previously and 20 similar foil statements. Beneath each statement were two buttons (Yes and No) participants could select.

The source memory task (modeled after Taylor and colleagues' "Who Said What?" paradigm, 1978) similarly tested participants' recall for the movie and audio, though here they were asked to recall which of the speakers made each statement. The display screen

was similar to that of the movie, but with no Skype background; instead, the 8 speaker photographs were displayed on a white background, with their appropriate names written in black below their pictures. For each statement, the array of photographs was randomized (rather than the photographs being in the same order as the array displayed in each participant's version of the movie), such that attribution related specifically to the speaker rather than that speaker's position on the screen during the movie (see *Fig. 5*).

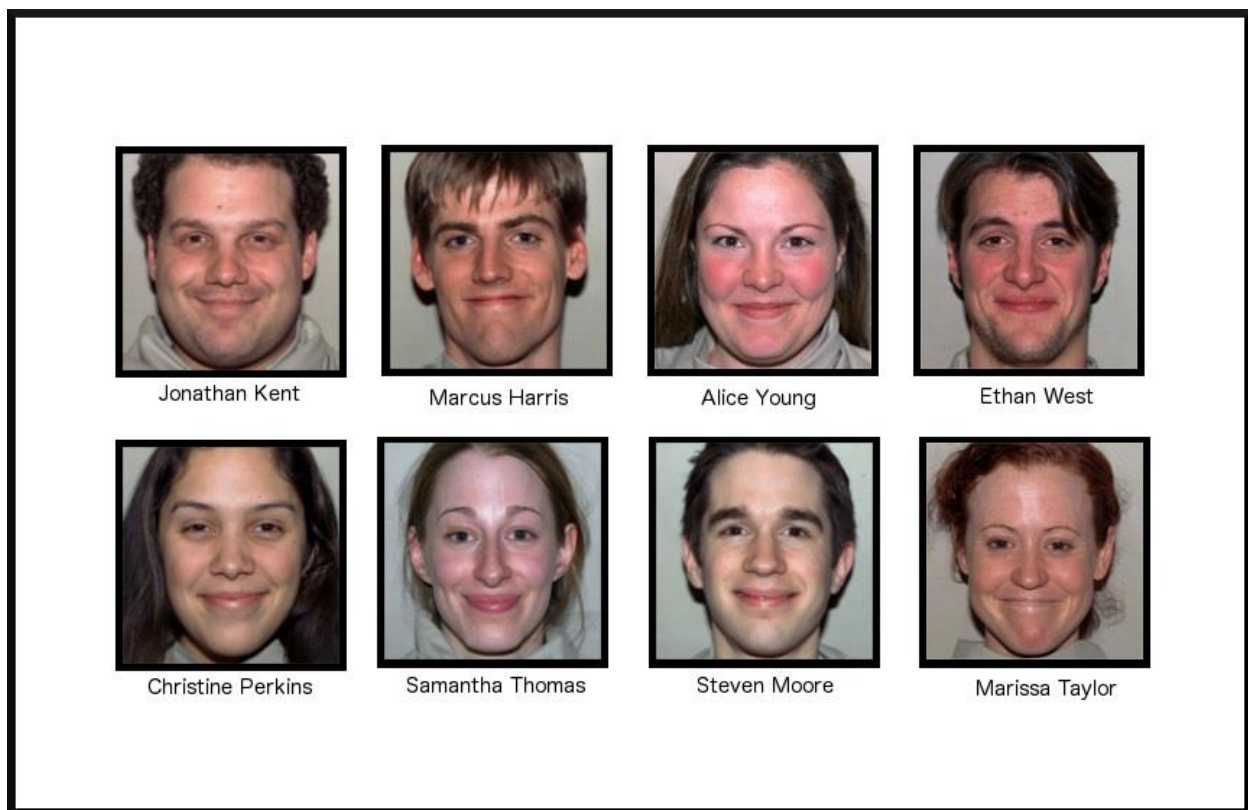


Figure 5. Speaker selection screen for source memory task.

Procedure

Participants arrived at the lab and were greeted by the experimenter. The experimenter also gave them a cover story (also seen onscreen) that they would be listening to a focus group discussion held over Skype amongst college seniors about their opinions on job seeking and interviews after graduation. In order to avoid suspicion,

participants were told that for optimal conversational clarity, all background noise and interruptions were filtered out of the recorded dialogue. Additionally, in order to ensure that participants understood the screen interface, they were informed that though the discussion group was recorded with still photographs and audio only, the Skype interface would indicate the current speaker by highlighting her/his photograph with a blue outline.

Participants were then instructed to listen carefully to the focus group discussion, beginning with a series of brief introductions and followed by the discussion itself. They were also told that after listening to the dialogue that they would be asked for their own opinions about job seeking post-graduation, as well as about how useful they thought the advice given by each of the focus group participants was (for the complete instructions, see *Appendix 3*).

After reading all instructions, participants watched and listened to their version of the Skype movie. For the entirety of the movie, participants were required to keep their chins in the chin rest in order to control potential head movement, and their gaze was recorded using the eye tracker. Following the movie, participants completed the memory and attribution portions of the study, in which they were asked, "Is the following statement one you heard previously?", followed by a randomly displayed written version of one of the 52 statements. If they selected the "No" button, they proceeded on to the next written statement. If they selected the "Yes" button, they proceeded to the attribution portion related to that statement, in which they were asked to select the speaker who made that statement out of the display of 8 speaker photographs. The same procedure was used for all 52 recall statements.

Participants then completed a demographic questionnaire following the memory and attribution tasks. Additionally, all participants were questioned by the experimenter as to any potential suspicion of the study's aims or familiarity with any of the speakers' voices (no suspicion or previous familiarity with the speakers was found). Participants were then debriefed, given study pool credit, and thanked for their participation.

Study 1 Results

In order to assess both attention and memory, as well as their relation to each other, we will examine differences in participants' regard for others based on target sex through: 1) attention as determined by gaze directing through the eye tracker; 2) memory as determined through post-movie recall and recognition tasks; and 3) potential relationship(s) between attentional directing and subsequent memory.

Attentional Relevance through Eye Tracking

To determine when women compared to men are considered attentionally relevant, we will analyze selective attentional focus directed towards differently sexed targets in various contexts. First, we will compare looking times at target faces based on target sex at the initial viewing screen, during which targets are an exclusively physical presence without any speech. Following this, we will conduct similar analyses of gaze directing once questions are posed by the interviewer and answers from the targets are being awaited.

Additionally, all analyses of gaze directing following questions being posed to the targets will be broken up into two separate analyses based on the gendered content of those questions. The majority of questions posed are gender neutral; however, two

feminine-typed, appearance-related questions are also used as controls, in order to ensure that any changes in looking time after a contextual shift to one of audibility in addition to physicality occurs due to a corresponding contextual shift to a domain outside of the female representational repertoire.

Finally, we will also compare looking times at target faces based on target sex while targets are giving their answers to the questions previously posed to them by the interviewer. In other words, we will examine participant looking while they are listening to specific targets speak.

Relevance without speech. Based on previous research on female hyper-visibility, we predicted that women would gain more public relevance based on physicality alone. Thus, female faces should gain more attention (i.e., should be looked at more) than male faces at the initial viewing screen, during which the targets are only physically present and there is no simultaneous speech.

In order to examine potential differences between looking times at male and female faces, participant POR at each 1/60th ms during the 4-second initial viewing screen was recorded as belonging to one of three categories, such that participants were coded as directing their gaze toward: 1) any of the 4 *female* target faces; 2) any of the 4 *male* target faces; or 3) irrelevant data (i.e., due to there either being no useable data or subjects looking at the Skype background screen, off screen, etc.). In addition to recording the actual time that participants spent looking at both gendered target faces, the *percentage* of

time spent looking at both gendered target faces was taken out of the total time of the initial viewing screen.⁵

As predicted, there was a difference in the time participants spent looking at men compared to women during the initial viewing screen, $t(44)=2.19, p=.034$. Specifically, they spent more time looking at women ($M=1332.96$ ms, $SD=822.42$ ms) than men ($M=947.78$ ms, $SD=656.22$ ms) when the targets were only physical presences who were not speaking (see *Fig. 6* for these means based on percentage of total viewing time).

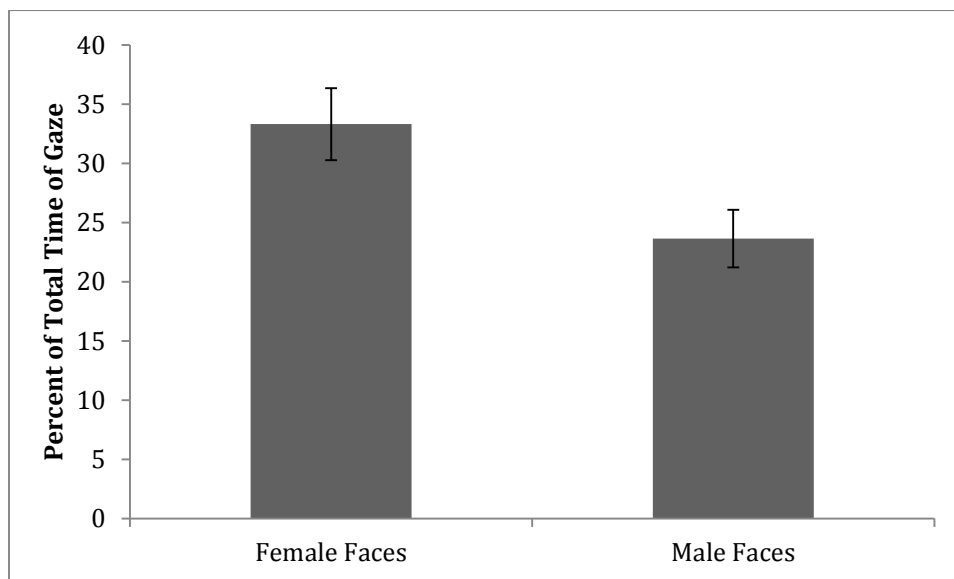


Figure 6. Visual fixation on silent male and female targets. Error bars are standard error.

Relevance following neutral questions. We also predicted that women should lose public relevance once there was an expectation that targets could respond to questions. Specifically, we predict that in between the time of a question being posed and any answers being given, that female targets will receive less visual attention than they did when there was no expectation of target speech, at least following questions with gender

⁵ Participant sex was not a significant factor in any of the subsequent analyses of this study and therefore will not be discussed.

neutral content (control questions with feminine content are addressed in the following section). Meanwhile, the same should not be true for men, who we expect will maintain their attentional relevance when participants are expecting answers to be given.

In order to examine potential differences between looking times at male and female faces, we again used participant POR at each 1/60th ms during the spaces between the posing and answering of interview questions (divided into two categories of gender neutral content questions and stereotypically feminine-typed content questions), recorded as belonging to one of three categories such that participants were coded as directing their gaze toward: 1) any of the 4 *female* target faces; 2) any of the 4 *male* target faces; or 3) irrelevant data (i.e., due to there either being no useable data or subjects looking at the Skype background screen, off screen, etc.).⁶ Importantly, we also found the *change* in the percentage of time spent looking at male and female faces after each type of question was posed as compared to the baseline of the initial viewing screen. This was done in order to examine differences for looking at men and women when the context shifted from one of strictly physical presence alone to one that included the expectation of target speech in addition to their physical presence.⁷

We found that after gender neutral questions were posed, the difference in looking times for female compared to male targets disappears, $t(44)=1.01, p=.320$. Specifically, participants spent equivalent amounts of time looking at women ($M=9202.22$ ms, $SD=5295.10$ ms) as men ($M=8053.33$ ms, $SD=5081.03$ ms) when targets were expected to

⁶ Participant sex was not a significant factor in any of the subsequent analyses of this study and therefore will not be discussed.

⁷ Change from baseline was taken because the baseline is that of physical visibility, while new viewing times were taken in a context of not only audibility but *also* physical visibility. Therefore, a difference measure can ascertain how the addition of audibility changes looking times.

speak in addition to being physical presences on the screen (see *Fig. 7* for these means based on percentage of viewing time).

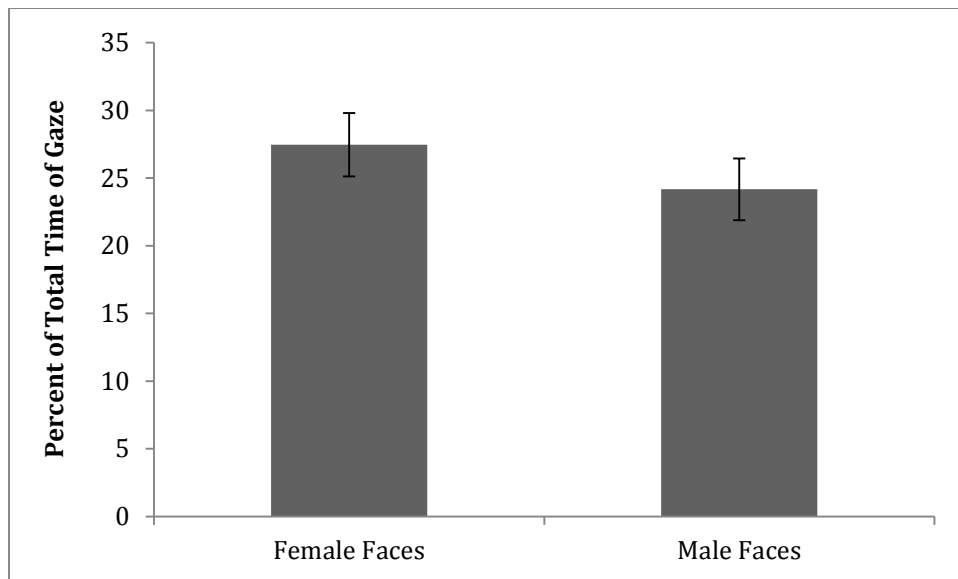


Figure 7. Visual fixation on male and female targets following neutral questions. Error bars are standard error.

Importantly, however, participants *did* show a significant difference in the *change* in the percentage of time they spent looking at women as compared to men after questions were posed as compared to the initial baseline, $t(44)=-2.27$, $p=.028$, such that they showed a greater decline in the percent of time devoted to attending to female compared to male faces once questions were posed as compared to when faces were presented as purely physical entities without speech expectation (see *Fig. 8*). Specifically, participants showed a significant decline in the percent of time they spent looking at female faces, $t(44)=-2.66$, $p=.011$. In contrast, while there was a slight increase in the percentage of time devoted to looking at male faces, this increase was not significant, $t(44)=0.41$, $p=.685$.

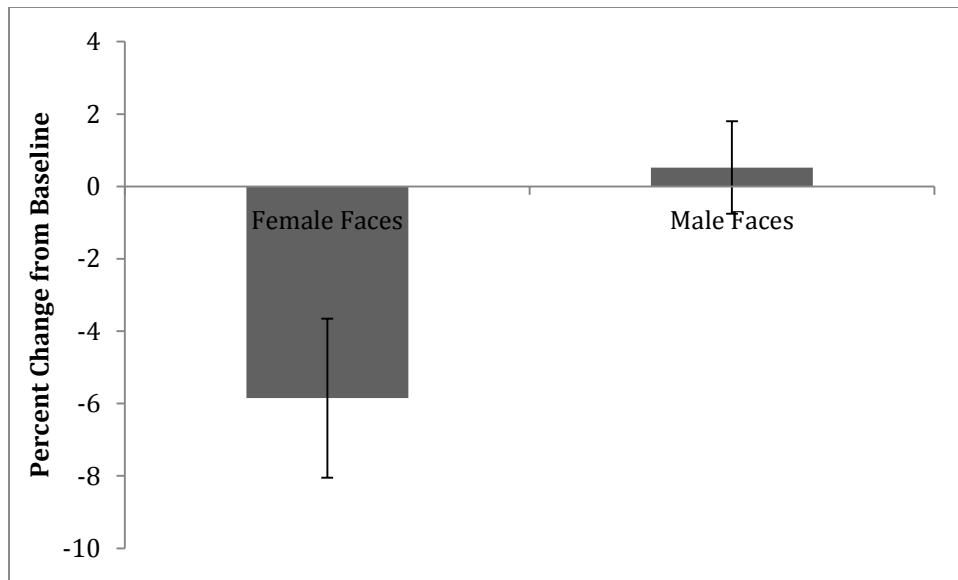


Figure 8. Change in visual fixation from baseline following neutral questions. Error bars are standard error.

Relevance following feminine questions. While we predicted that women would lose relevance once there was the possibility of speech (i.e., while target answers to posed questions were being awaited), we also hypothesized that this would only be true when that expected speech was not based in stereotypically feminine content. Otherwise, women should continue to receive increased visual attention when feminine questions are posed, as any potential speech will be related to a subject following within stereotypically feminine domain. In order to examine potential differences between looking times at male and female faces, we used the same process of analyses for visual fixation following feminine questions as with the gender neutral questions described above.⁸

However, in contrast to our predictions, we did not find a difference in time spent looking at female as compared to male faces, $t(44)=1.04$, $p=.303$. As with the gender neutral questions, participants spent roughly equivalent amounts of time looking at women

⁸ Again, participant sex was not a significant factor in any of the subsequent analyses of this study and therefore will not be discussed.

($M=1741.11$, ms, $SD=1145.52$ ms) and men ($M=1468.89$ ms, $SD=1118.65$ ms) when targets were expected to speak in response to questions related to appearance (see *Fig. 9* for these means based on percentage of viewing time).

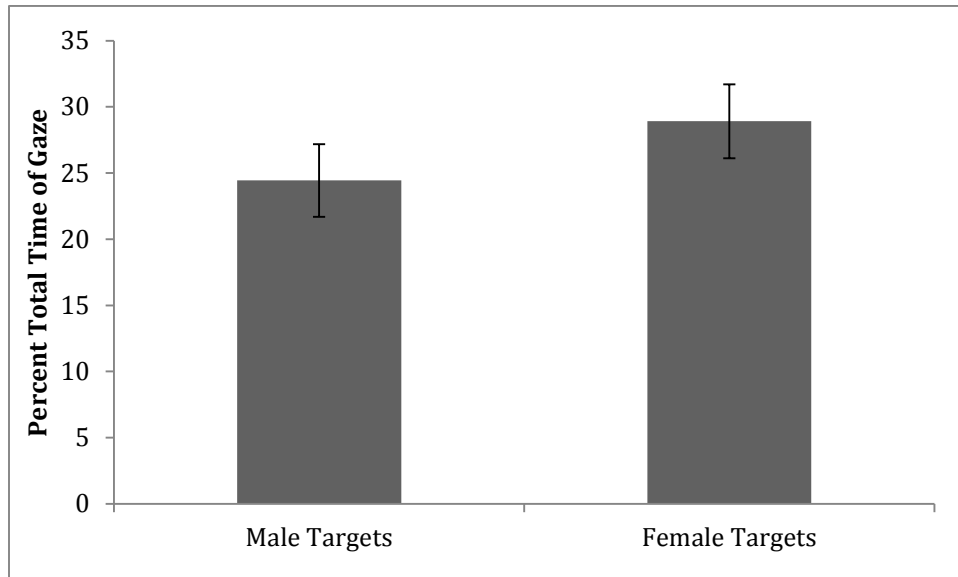


Figure 9. Visual fixation on male and female targets following feminine questions. Error bars are standard error.

However, unlike with gender neutral content questions, participants did *not* show a significant difference in the *change* in the percentage of time they spent looking at women as compared to men after feminine-typed, appearance-related questions were posed as compared to the initial baseline, $t(44)=1.20$, $p=.237$. In other words, there was in this case no significantly greater decline in the percent of time devoted to attending to female compared to male faces once specifically *feminine* questions were posed as compared to when faces were presented as purely physical entities without speech expectation (see *Fig. 10*). Specifically, participants showed no change in the time they spent looking at either female faces ($t(44)=-1.60$, $p=.117$) or male faces ($t(44)=-0.34$, $p=.732$).

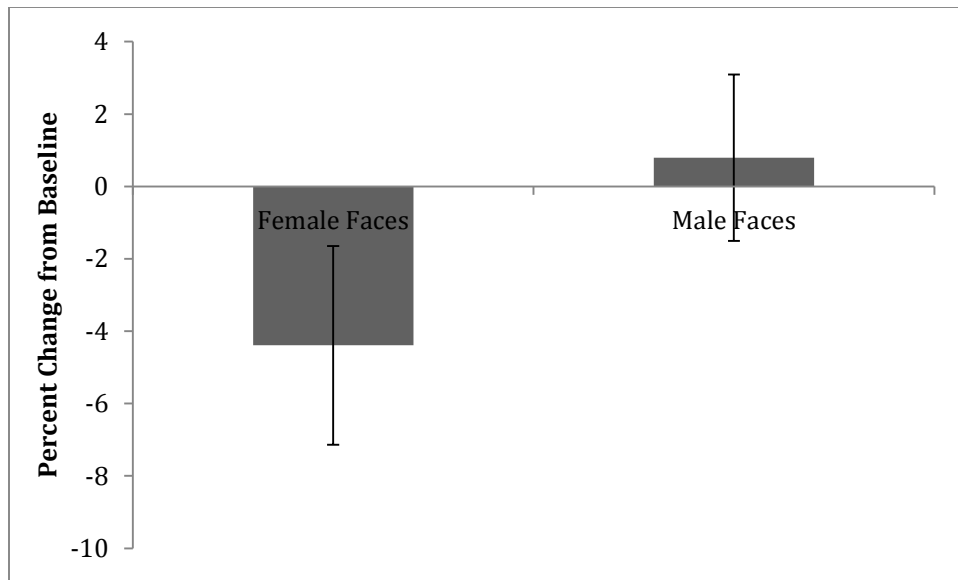


Figure 10. Change in visual fixation from baseline following feminine questions. Error bars are standard error.

Looking while listening. We also ran an exploratory analysis on looking times during answers to interview questions, examining whether or not participants actually looked at a given target while s/he was speaking. Regardless of whether participants were more likely to spend time looking at the correct speakers when they were male or female, we believe further analysis will be necessary to determine whether increased looking is due to increased audibility relevance or a lack of expectation of hearing either group of speakers (to be examined in the memory portion of analyses).

In order to explore potential differences between looking times at male and female speaker faces, we again used participant POR at each 1/60th ms during the times at which targets gave answers to interview questions (32 answer statements given in total), which was recorded as belonging to one of three categories such that participants were coded as directing their gaze toward: 1) the *correct* target face (i.e., looking at the target who was actually speaking at the time); 2) any of the 7 other *incorrect* target faces (i.e., looking at

any of the targets who were *not* speaking during a target's answer); or 3) irrelevant data (i.e., due to there either being no useable data or subjects looking at the Skype background screen, off screen, etc.).⁹

We found that there was indeed a significant difference in the percentage of time spent looking at the correct speaker face based on the gender of the speaker ($t(44)=2.07$, $p=.044$). Specifically, participants spent a higher percent of time looking at the correct female speaker than the correct male speaker while they were listening to their statements (see *Fig. 11*).

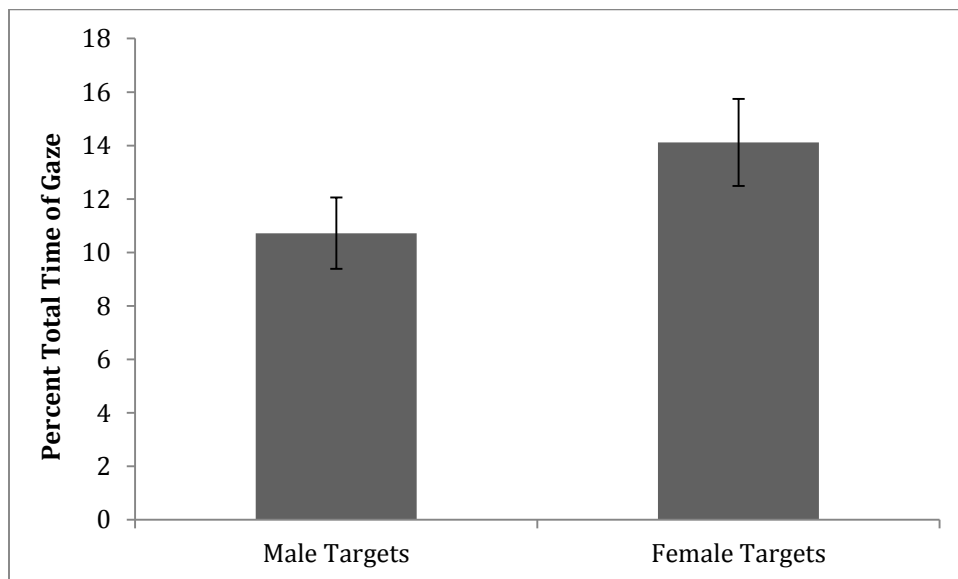


Figure 11. Visual fixation on male and female targets during speech. Error bars are standard error.

Post-Task Stimuli Memory

Subsequent processing of attended information was also examined by analyzing potential differences in memory for differently sexed speakers. We were specifically concerned with two separate aspects of memory. The first was *recognition memory*,

⁹ Again, participant sex was not a significant factor in any of the subsequent analyses of this study and therefore will not be discussed.

involving participant accuracy in determining whether or not they had previously heard statements made by female compared to male speakers. The second was *source memory*, involving perceiver accuracy in locating the correct female compared to male speakers in relation to their previously given statements (i.e., memory for audible subjects).

Statement recognition memory task. A 2-way mixed factorial ANOVA was used to examine the effects of target sex and participant sex on recall for statements (i.e., participants correctly recalled hearing a given statement). As predicted, we did not find any significant main effects on statement memory (see *Fig. 12*) in terms of target sex ($p=.272$) or subject sex ($p=.225$), nor was there a significant interaction effect ($p=.224$).

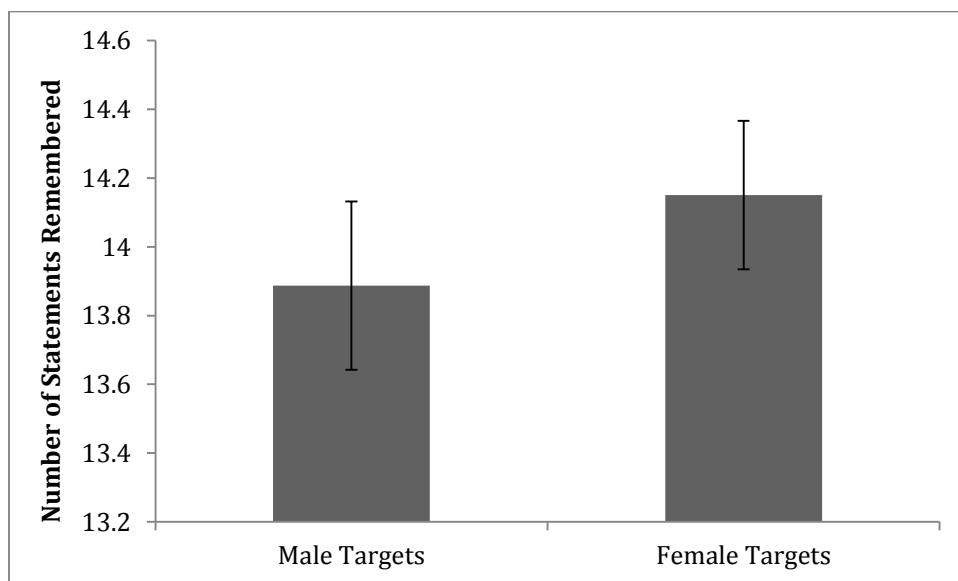


Figure 12. Recognition memory for male and female targets' statements. Error bars are standard error.

Source recall memory task. We also used a 3-way mixed factorial ANOVA was used to examine the effects on misattribution (i.e., statements listeners recalled hearing but for which they incorrectly recalled the source) of target sex, participant sex, and gender

congruency (misattributing speaker source to a gender congruent (i.e., misattributing a female speaker's statement to another female speaker or misattributing a male speaker's statement to another male speaker) or to a gender incongruent (i.e., misattributing a female speaker's statement to a male speaker or misattributing a male speaker's statement to a female speaker) source). We hypothesized that participants would be more likely to misattribute statements' sources when those statements were made by female speakers rather than by male speakers. Additionally, we predicted that participants were more likely to make gender congruent than incongruent attribution errors.

We found a nonsignificant trend towards our hypothesis in terms of the effect of target sex of misattribution, $F(1,52)=1.59$, $p=.213$, with participants misattributing more female than male statements on average. This effect, however, was qualified by an interaction effect of target sex and subject sex, $F(1,52)=6.14$, $p=.017$ (see *Fig. 13*; discussed further below).

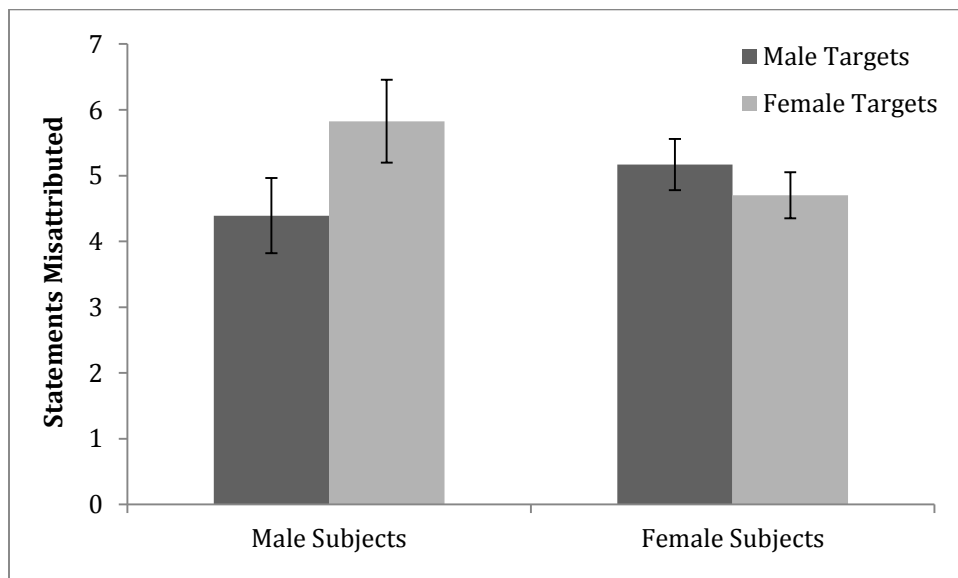


Figure 13. Misattribution (incorrect source recall) of male and female targets' statements based on subject sex. Error bars are standard error.

Additionally, as predicted there was a significant effect of gender congruency, $F(1,52)=63.29, p<.001$, with participants showing a greater tendency to misattribute speaker statements to a gender congruent than incongruent source (an analysis of percent of statements misattributed gender congruently showed that both male ($t(47)=22.06, p<.001$) and female ($t(50)=21.52, p<.001$) targets were significantly more likely than chance to have their statements misattributed to a gender congruent target). However, this effect was qualified by a three-way interaction of subject sex, target sex, and gender congruency, $F(1,52)=7.48, p=.009$.

A simple effects analysis of male subjects resulted in a significant effect of target sex, $F(1,22)=4.38, p=.048$, with greater misattribution of female as compared to male targets. Additionally, male subjects made more intrasex than intersex misattribution errors, $F(1,22)=31.60, p<.001$. However, these main effects also showed a marginally significant interaction, $F(1,22)=3.44, p=.077$, and further analysis shows that while men tended to misattribute both male and female speakers' statements to a gender congruent source ($F(1,22)=3.35, p=.081$ and $F(1,22)=29.25, p<.001$, respectively), they were more likely to commit such intrasex attribution errors in relation to *female* (i.e., gender outgroup) speakers.

In contrast to male subjects, female subjects showed no main effect of speaker sex in rates of misattribution ($F(1,29)=1.24, p=.276$), and were equally likely to misattribute target statements regardless of target sex. They were also, however, significantly more likely to make intrasex than intersex misattribution errors, $F(1,29)=32.28, p<.001$, an effect that was qualified by an interaction of target sex and gender congruency in misattribution, $F(1,29)=4.06, p=.053$. Specifically, while female participants tended to misattribute both

male and female speakers' statements to a gender congruent source ($F(1,29)=27.05, p<.001$ and $F(1,29)=4.57, p=.041$, respectively), they were more likely to commit such intrasex attribution errors in relation to *male* (i.e., gender outgroup) speakers (see Fig. 14 for percentages of male and female targets misattributed to gender congruent sources).

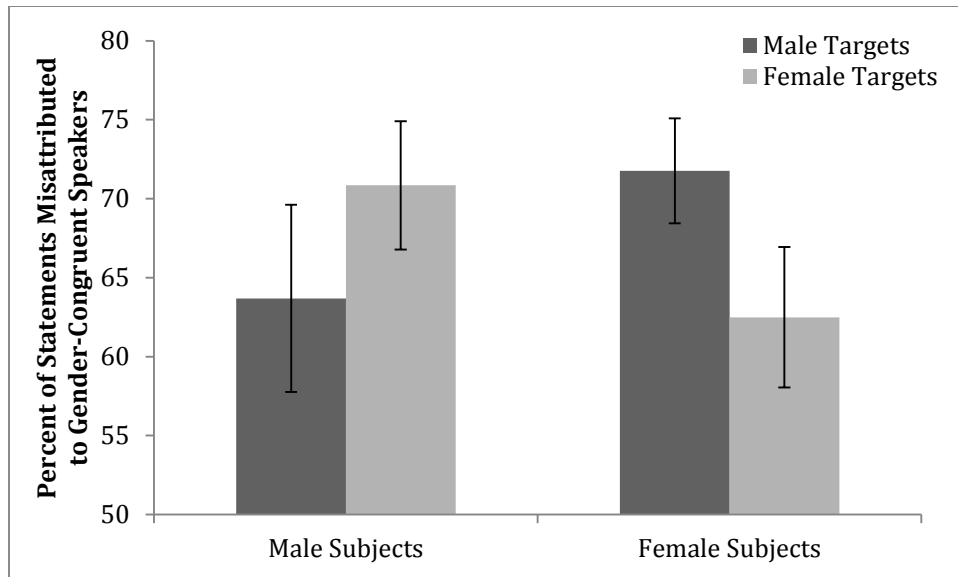


Figure 14. Intrasex misattribution of male and female targets' statements based on subject sex. Error bars are standard error.

Relationship between Attention and Memory

To examine the seeming lack of a relationship between attentional directing and memory based on target sex in more detail, a hierarchical regression analysis was conducted to predict the likelihood of speaker misattribution. The main effect of the percentage of time spent looking at the correct speaker (i.e., attentional directing toward the currently speaking target), along with the main effects of target sex and subject sex (centered scores), were predictors in the first level of the regression. The interactions

between each of these measures, along with a three-way interaction, were predictors in the second level of the regression.

The relationships between the percent of time spent looking at the speaker, target sex, and subject sex with likelihood of misattribution were all non-significant ($\beta=-.008$, $\beta=-.037$, and $\beta=.055$, respectively), as suggested by previous analyses. The second level of the regression analysis only showed a significant positive relationship between the likelihood of misattribution and the interaction of time spent looking at the speaker and subject sex, $\beta=.228$, $p=.055$. Additionally, there was a trend toward a positive relationship between the likelihood of misattribution and a three-way interaction of looking at the speaker, target sex, and subject sex, $\beta=.151$, $p=.202$, though this relationship did not reach significant. There were no other significant main or interaction effects (see *Table 1*).

Table 1.
Hierarchical multiple regression analysis of likelihood of speaker misattribution.

Continuous Variables	B	SEB	β	p	R ²
Model 1					0.004
% of Time Looking at Speaker	-0.20	2.70	-0.008	0.942	
Target Sex	-0.09	0.27	-0.037	0.733	
Subject Sex	0.14	0.27	0.055	0.614	
Model 2					0.074
% of Time Looking at Speaker	-1.534	2.90	-0.062	0.598	
Target Sex	-0.231	0.27	-0.093	0.401	
Subject Sex	0.212	0.27	0.085	0.439	
% of Time Looking at Speaker * Target Sex	-2.072	2.90	-0.083	0.476	
% of Time Looking at Speaker * Subject Sex	5.63	2.90	0.228	0.055	
Target Sex * Subject Sex	-0.244	0.27	-0.099	0.374	
Three-way Interaction Effect	3.728	2.90	0.151	0.202	

A subsequent regression analysis of *male subjects only* showed no significant correlations of likelihood of misattribution with percent of time spent looking at the speaker, speaker sex, or an interaction of the two (see *Table 2*). Thus for male subjects we

find no relationship between attending to speakers and subsequent accuracy of source attribution, regardless of whether the speakers were male ($\beta=.237, p=.329$) or female ($\beta=.081, p=.741$).

Table 2.
Hierarchical multiple regression analysis for male subjects only of likelihood of speaker misattribution.

Continuous Variables	B	SEB	β	p	R ²
Model 1					0.052
% of Time Looking at Speaker	4.19	4.54	0.153	0.362	
Target Sex	-0.46	0.49	-0.155	0.356	
Model 2					0.055
% of Time Looking at Speaker	4.10	4.61	0.149	0.380	
Target Sex	-0.48	0.50	-0.16	0.347	
% of Time Looking at Speaker * Target Sex	1.66	4.61	0.06	0.721	

A regression analysis of *female subjects only*, however, shows a different pattern of results. While there are no main effects of either the percent of time spent looking at speakers or target sex and subsequent likelihood of misattribution in level 1 of the hierarchical regression ($\beta=-.194$ and $\beta=.059$, respectively), this changes once the interaction effect of percent of time looking at the speaker and target sex are added to level 2 of the analysis. Here the main effect of time looking at the speaker becomes *negatively* correlated with the likelihood of misattribution, $\beta=-.331, p=.049$. Thus, female participants show the standard relationship between attention and memory, such that the more visual attention they grant to speaking targets, the greater their accuracy in subsequent recall of who said what (see *Table 3*). This relationship, however, is qualified by a trend toward an interaction effect of percent of time spent looking at the speaker and the speaker's sex, $\beta=-.261, p=.109$. Specifically, female subjects only show a relationship between the percent of time spent looking at the speakers and subsequent likelihood of speaker misattribution for

male speakers, $\beta = -.396$, $p = .046$, for whom they were less likely to misattribute statements the more they visually attended to those male speakers while they were making such statements (see Fig. 15). For *female speakers*, however, female subjects showed no relationship between the percent of time spent looking at those female speakers and subsequent accuracy in attribution of their statements, $\beta = -.079$, $p = .702$ (see Fig. 15).

Table 3.

Hierarchical multiple regression analysis for female subjects only of likelihood of speaker misattribution.

Continuous Variables	B	SEB	β	p	R ²
Model 1					0.047
% of Time Looking at Speaker	-4.21	3.11	-0.194	0.181	
Target Sex	0.12	0.29	0.059	0.685	
Model 2					0.097
% of Time Looking at Speaker	-7.16	3.55	-0.331	0.049	
Target Sex	0.01	0.29	0.007	0.964	
% of Time Looking at Speaker * Target Sex	-5.80	3.55	-0.261	0.109	

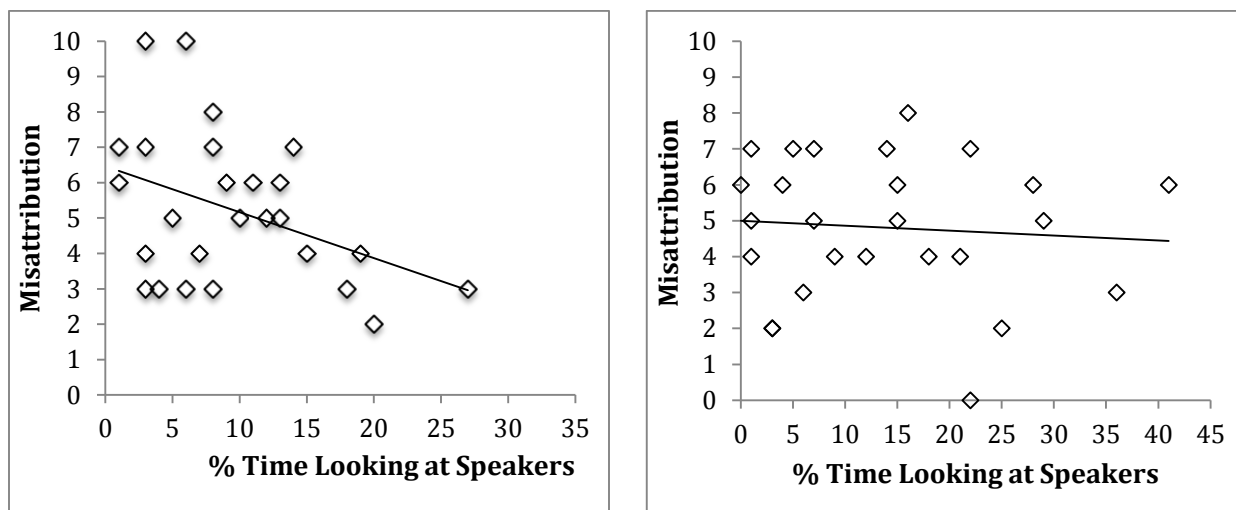


Figure 15. For *female subjects*, the relationship between visual fixation and misattribution for *male targets* (left graph) and *female targets* (right graph).

Study 1 Discussion

Across studies on both attention and subsequent processing, we find support for our hypothesis that women but not men gain public relevance conditionally based on their physical presence over their social audibility. By tracking attentional focus through visual fixation, we found support for the hyper-visibility of women compared to men. Like previous research, our results showed that women are perceived as more relevant as the objects of external gaze in a public context based on exclusively physical presence (i.e., during the initial viewing screen), a relevance related strictly to the passive presence and visibility of their physicality. Once the context becomes one of not only physicality but also of social audibility (i.e., through questions being posed to targets with the expectation of those targets answering through their own speech), however, attention shifts away from women, as they are no longer as relevant once there is the possibility of public voice through the assertion of mind. Men, on the other hand, retain their attentional relevance despite the changing context due to their consistent public relevance, with male relevance not contingent on the *specific* public context in the way that female relevance is. This is primarily the case when audibility is related to a gender neutral context, however, as in feminine-typed, appearance-related audibility situations women still retain increased attentional focus.

There may be some evidence that contradicts these initial findings of decreased female audibility, though. We also found that perceivers actually exhibit greater visual attendance to women than men during speech, which has also been demonstrated in other research on women's hyper-visibility (Argyle & Williams, 1969). We might therefore conclude that women are instead *more* socially audible, that despite decreased anticipation

or expectation of their speech following questions being posed, their actual speech given in response to questions is considered *more* relevant than are men's responses. However, there is also a possible alternative explanation to this difference in female social audibility: If there is the expectation that men will be more likely to assert their audibility and make themselves heard when speech is expected, then it may be that when women speak instead it is surprising and contrary to expectation. The greater attendance to female speakers would therefore arise as a result of *surprise* rather than because of an actual increased attendance to these women as audible subjects.

We found that despite increased attention given to female speakers, there was no subsequent increased recall for the statements made by women, though there was also not the predicted trend toward decreased memory for these statements either. Yet as there was a ceiling effect in statement recognition accuracy, we cannot conclude much from these results, and therefore emphasize results related to source attribution recall. Here we indeed found decreased memory for women's assertions of audibility (i.e., decreased accuracy in attributions made for female speakers' statements) despite the increased attention afforded to them while they made those statements (at least by male subjects, though female subjects also did not show any increased attribution accuracy for female speakers despite greater visual attendance to these women while they were speaking as well). This implies that the increased attention paid to female speakers does not originate in their increased audibility and relevance during speech, but instead due to the increased salience that arises from the surprise or unexpectedness involved in women answering questions rather than men.

Overall, our examination of post-attendance memory implies that it is not that women are less audible through not being *heard* while they are speaking, but rather that *the contents of women's speech are less likely to be attributed to them*. Thus, despite the increased attention afforded to women while they are speaking, subsequent processing of women as the sources of such speech is inhibited due to their comparative lack of relevance in the context of social audibility. This results in the decreased memory for women as speaking, audible subjects, especially amongst male participants.

Further, a more direct analysis of the relationship between attention and memory similarly demonstrated that while visual attendance during speech is related to further cognitive processing of (and thereby improved memory for) *men* as audible subjects, this same relationship between attention and memory in the context of social audibility does *not* exist for *women*. We therefore not only find that the increased visual attendance to female speakers is due to the unexpected nature of female compared to male speech, but also that the lack of female relevance in the domain of audibility translates into a corresponding lack of the standard relationship between attention and memory in regards to women as audible subjects. In contrast, increased attention to men during speech positively relates to the memorability of those men as audible subjects.

It thus seems that only when the domain in question falls within a subject's representational repertoire does increased attentional focus relate to similarly increased memory for the subject within that domain. As men have representational relevance in the domain of social audibility, when they are attended there is further cognitive processing of them in terms of their audibility. On the other hand, as women have less representational relevance in the domain of social audibility, when they are attended there is no such

further cognitive processing of them in terms of their audibility. Perhaps if we explored the relationship between attention and memory of women within a domain in which they *do* possess representational relevance—such as the domain of physicality/appearance—we would find this same pattern of attendance relating to further cognitive processing of women, but in terms of memory for their *visibility* rather than their *audibility*. However, we cannot extend our results to the domain of physical visibility as we did not explore potential differences in memory for physicality, and only demonstrate here a lack of the standard relationship between attention and memory for women (but not men) in terms of their social audibility.

Additionally, the discovered positive correlation between attention and memory for men but not women as audible subjects exists only for *female participants*. Male participants, on the other hand, show no relationship between attention and memory in terms of audibility for both male *and* female speakers. This difference may arise due to a gendered discrepancy in gaze directing toward an interlocutor while listening versus while speaking. Specifically, visual dominance behavior involves looking less at an interlocutor while listening but looking more at an interlocutor while speaking, a tendency that is gendered based on men typically asserting more power and dominance than women in social interactions (Dovidio, Brown, Heltman, Ellyson, & Keating, 1988; Dovidio & Ellyson, 1982). In terms of gendered patterns of attentional directing, this translates into men looking *more* at their interlocutors than women while *speaking* themselves, but looking *less* at their interlocutors than women while *listening* to their interlocutors speak (though this pattern only holds when the content of discussion is gender neutral or masculine; when the content of discussion is specifically feminine in nature, women look more at their

interlocutors than men while speaking and look less at their interlocutors than men while listening). Furthermore, men tend to look more at their interlocutors while speaking than listening, while the opposite is true for women, who instead look more while listening than speaking (though again, this pattern holds with the exception of feminine rather than gender neutral or masculine topics of discussion, during which men and women display the opposite pattern of their usual visual attention behaviors; Dovidio et al., 1988). The lack of a relationship between attention to and memory for both male and female speakers' audibility on the part of male participants might therefore reflect a more general tendency for men to engage in visual attendance during their own speech rather than while listening to the speech of others. Meanwhile, women engage in visual attendance more for listening to the speech of others, but the resultant relationship between attention and memory for speaker audibility appears to extend only to male speakers.

Thus, the attendance to female over male speakers (as well as the equivalent memory for statements made by female and male speakers) combined with both the misattribution of statements made by female speakers as well as a lack of any relationship between visual attendance and female audibility recall implies that though women's words are heard, those words are still not attributed to them. In other words, it is not that people do not attend to or hear what women say, but rather that they do not attribute the contents of female voice and female assertions of audibility to the women themselves. Additionally, visual attendance granted to women while they are speaking does not result in actual further cognitive processing of their speech even though it does for male speakers. Women can therefore regain the attention they lose in contexts of public audibility through the

assertion of voice, but that does not necessarily mean that they similarly regain their social relevance, at least not in the domain of audibility.

Finally, we also found a tendency to misattribute speaker statements to other within gender targets, such that perceivers indeed tended to remember speakers and their statements in terms of social categorization based on sex. This was especially true of the gender outgroup, with both male and female participants confusing opposite-sexed speakers with each other in attribution recall more often, which implies perceptions of outgroup homogeneity and potentially decreased outgroup relevance. Additionally, such results confirm that target sex is indeed a salient social group categorizer in this study, used in the encoding and processing of information about speakers and their statements.

Yet while we find that female physicality is privileged over that of their audibility in a public context, it remains unclear whether this relationship between physical visibility and social audibility for women is a dichotomous one. In other words, we must still ask if the decreased relevance of female social audibility is a *direct result of* the increased privileging of their physical visibility, such that emphasis on the visibility of the passive female body *comes at the expense of* women's assertion of mind through social audibility. In contrast, it is possible that the normalized and pre-established contextual relevance of men in a public domain leads to a lack of any such dichotomous exchange between physical visibility and social audibility.

Introduction to Study 2: Evaluative Tradeoffs of Appearance and Personhood

Some research in the field of sexual objectification has indeed shown that there is a related exchange between valuation of the female body at the expense of the mind, while

the same is not true for men. Research demonstrating that the sexualized female body leads to women being viewed as objects rather than subjects is demonstrative of a corresponding focus on the female body at the expense of the mind (Bernard et al., 2010; Cikara et al., 2010; Fiske, 2009; see previous section on sexual objectification for elaboration). Additionally, focusing on a woman's appearance has been found to cause observers to perceive her as less characteristic of what it means to be human through lower ratings of characteristics typifying human nature, including competency, morality, agency, and general attributions of complex mental state and "mind." For example, when instructed to focus on the appearance rather than the performance of a female newscaster, participants perceived her as less warm, moral, and competent, but perceptions remained constant for a male newscaster regardless of whether participants were instructed to focus on his appearance or his performance. These results were unaffected by the actual attractiveness of the targets (Heflick et al., 2010). A similar study conducted by Heflick and Goldenberg (2009) found that when participants were instructed to write a brief essay on the appearance or personhood of a famous female targets (vice presidential candidate Sarah Palin or actress Angelina Jolie), subsequent ratings of traits related to humanness/personhood were lower when participants had focused on the appearance of the target as opposed to her personhood. In addition, participants who wrote about Sarah Palin's appearance were less likely to report endorsement for the McCain-Palin ticket in the upcoming election.

However, it is not only women's appearance (i.e., bodies) that is used to discredit or distract from their personhood and audibility (i.e., minds). Instead, even personal rather than just physical aspects of women can be used as a means of diverting attention from

their attempts to assert ideas, beliefs, arguments, and other expressions of social audibility. For example, a survey of news coverage given to candidates during political races showed that there is greater focus on actual issue positions for male candidates as compared to female candidates. Further, coverage of female candidates shows a greater focus on personal traits and characteristics that are unrelated to actual issue positions than does coverage of male candidates. In sum, the decreased news coverage of female candidates' positions on political issues compared to their male counterparts is caused by a shift in focus towards discussion of personal character in exchange (Dunaway, Lawrence, Rose, & Weber, 2013).

Such research, like our own, indicates the *conditionality* of women's relevance in the public sphere. We therefore propose that female social audibility is qualified and affected by other external types of information, specifically those related to the body (i.e., appearance) and, with less emphasis, the mind (i.e., personhood information specific to personal traits and background related to the private domain in particular). Additionally, as female relevance is more closely associated with physicality, it follows that information related to the body is privileged at the *direct expense* of information related to the mind in evaluations of their social audibility. Thus, when women are being evaluated on the *content* of their voice, the effects of a biography (i.e., personhood/mind-related information) on evaluations should be negated by the inclusion of a photograph (i.e., appearance/body-related information). In other words, we predict that for women the inclusion of a biography should show an effect on evaluations only when a photograph is not also included (based on the overriding effect of appearance information, which should negate the evaluative effect of personhood information). In contrast, appearance

information will show no direct effect on evaluative ratings (based on previous sexual objectification research showing no evaluative effects of appearance information for non-sexualized women), with its influence instead exerted through its determination of the weight of personhood information on evaluations.

In addition, we hypothesize that unlike female targets, male targets have pre-established contextual relevance in the public domain. We therefore predict that there will be no such exchange in the emphasis on information related to the mind or body in evaluations of men's social audibility. Instead, the contextual relevance of men in relation to audibility means that evaluations of this audibility will not be affected by external informational sources. Thus, we predict that for men the inclusion of neither a photograph nor a biography will show effects on evaluations of male social audibility.

Study 2a Methods

Participants

There were 143 participants (86 female, 57 male) with a mean age of 31.55 years (age range of 19-67 years). 130 of the participants described themselves as heterosexual, 1 as homosexual, and 10 as bisexual. All participants were recruited via Mechanical Turk and received the standard monetary compensation for their time.

Stimuli

All participants read the same article, an opinion-editorial espousing a pro-genetically modified foods stance. The article was 5 short paragraphs (508 words) in length and based on actual research on the topic. The article was in standardized *New York*

Times format, constructed to look as if it had been published in the online version of the newspaper. An opinion-editorial was specifically chosen for use in the study as an effective representation of assertion of personal voice, opinion, and social audibility.

We used a 2x2 design, in which we included two manipulations: the presence of appearance information (author photograph included or no photograph included) and the presence of personhood information (author biography included or no biography included). As follows, there were four conditions (see *Table 4*): 1) Control Condition (no photograph or biography included with article); 2) Appearance Information Condition (photograph included with article); 3) Personhood Information Condition (biography included with article); and 4) Appearance and Personhood Information Condition (photograph and biography included; see *Appendix 4*).

The photograph is of a middle-aged white woman rated in a pilot study with 14 participants on Likert scales (1-7, where a higher score indicates a more positive evaluation) as significantly above average in terms of competence ($t(13)=4.02, p=.001$), professionalism ($t(13)=2.78, p=.016$), warmth ($t(13)=3.29, p=.006$), and likeability ($t(13)=3.24, p=.006$), though not in terms of attractiveness ($p=.272$). The biography is two lines long with information about the author's professional (journalism career and previous employment) and personal (list of three hobbies, one stereotypically masculine, one stereotypically feminine, and one gender-neutral in content) life, rated in a pilot study as significantly above average in terms of competence ($t(7)=9.00, p<.001$), professionalism ($t(7)=9.00, p<.001$), warmth ($t(7)=3.00, p=.020$), and likeability ($t(7)=2.83, p=.026$), and there was also a trend toward the person in the biography being rated as above average in terms of desirability to meet/get to know ($t(7)=1.83, p=.111$).

Table 4.

Four study conditions based on the inclusion of a photograph and a biography with the article

Article Includes...	No Photograph	Photograph
No Biography	Control Condition	Appearance Condition
Biography	Personhood Condition	Appearance & Personhood Condition

Procedure

Participants were instructed to read the op-ed article, described as being from *The New York Times*. They were also told that once they had finished reading, they would be asked to evaluate various aspects of the article.

After reviewing the instructions and reading the article, participants evaluated the article on a variety of dimensions with Likert scales (1-7, where a higher score indicates a more positive evaluation). These evaluations included their overall article evaluation (ratings of article quality and article likeability), a reader interpretation of the article (agreement with the opinion of the author as expressed in the article and ease of understanding the article), as well as evaluations of the author's competence (knowledgeable, competent, insightful, and writing style), emotionality (emotional expressiveness and strength of conviction), and morality (morality, sincerity, and honesty). Evaluations on related domains were all combined in subsequent analyses. Participants then completed a demographics questionnaire and were thanked for their participation.

Study 2a Results

We assessed potential differences in article/author evaluations based on the availability of the author photograph and biography along with the article itself. We

hypothesized that for female authors there would be a privileging of physical over personal information in evaluations, such that the inclusion of a biography will show an effect on evaluations *only* when a photograph is not also included. To assess this prediction we used a 3-way between-subjects factorial analysis of variance (ANOVA) to explore the effects of participant sex, photograph inclusion (photograph or no photograph included with article), and biography inclusion (biography or no biography included with article) on various evaluations of the article and its author.

We found that for article evaluation ratings (combined article quality and article likeability ratings), there was a significant effect of biography inclusion, $F(1,142)=4.07$, $p=.046$, with higher ratings given to articles when there was a biography included than when there was not. In addition, there was a significant effect of participant sex, $F(1,142)=4.33$, $p=.039$, with female participants giving overall higher ratings than male participants. Of particular importance, the predicted interaction effect of photograph inclusion and biography inclusion was significant, $F(1,142)=7.37$, $p=.008$. There were no other significant effects. A simple effects analysis of *biography inclusion* showed that there was a significant difference in evaluative ratings based on the inclusion of a biography in the conditions that did *not* include a photograph, $F(1,76)=9.68$, $p=.003$, with participants rating the article more positively when there was a biography included than when there was not. However, the inclusion of a biography had no effect when a photograph was included with the article (see *Fig. 16*).

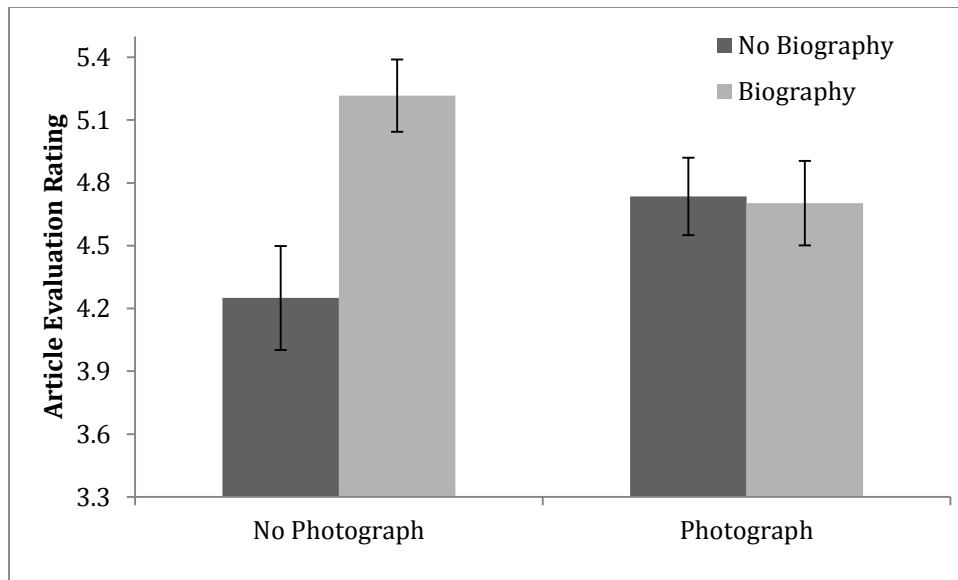


Figure 16. Article evaluation ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

We found the same pattern of results based on ratings of reader interpretation of the article (combined agreement with the opinion of the author as expressed in the article and ease of understanding the article ratings). There was a significant effect of the presence of biography inclusion on ratings, $F(1,142)=8.39, p=.004$, with higher ratings given to articles when there was a biography included than when there was not. Again, the effect of the biography on evaluations was qualified by a significant interaction effect of biography inclusion and photography inclusion, $F(1,142)=8.47, p=.004$. There were no other significant effects. A simple effects analysis of *biography inclusion* showed that there was again a significant difference in evaluative ratings based on the inclusion of a biography in the conditions that did *not* include a photograph, $F(1,76)=16.77, p<.001$, with participants rating the article more positively when there was a biography included than

when there was not. The inclusion of a biography had no effect when a photograph was also included with the article.¹⁰

Based on evaluations of the author's competence (combined author knowledgeability, competence, insightfulness, and writing style ratings), there was a significant effect of participant sex, $F(1,141)=4.59$, $p=.034$, with female participants giving overall higher ratings than male participants. We again found that the predicted interaction of biography inclusion and photograph inclusion was significant, $F(1,141)=7.33$, $p=.008$. There were no other significant effects. A simple effects analysis of *biography inclusion* showed that there was a significant difference in evaluative ratings based on the inclusion of a biography in the conditions that did *not* include a photograph, $F(1,75)=7.09$, $p=.010$, with participants rating the article more positively when there was a biography included than when there was not. The inclusion of a biography had no effect when a photograph was included with the article, however (see *Fig. 17*).¹¹

Yet again, the same pattern of results emerged in terms of evaluations of the author's emotionality (combined emotional expressiveness and strength of conviction ratings). Here, we found a significant effect of participant sex, $F(1,141)=5.21$, $p=.024$, with female participants giving overall higher ratings than male participants. Unlike on previous dimensions, however, there were no other significant effects.

¹⁰ As the pattern of results for reader interpretation evaluations is the same as that for general article evaluations, no graphical depiction of reader interpretation is included. However Figure 16 (general article evaluations) can be used as reference here, as it depicts an identical pattern of results.

¹¹ As the pattern of results across all author evaluation measures is consistent with that of author competence, no graphical depictions of evaluations of author emotionality or morality are included here. However Figure 17 (evaluation of the author's competence) can be used as reference for the remaining author evaluation measures, as it depicts a representative pattern of results on all of these dimensions.

Finally, we also found this pattern of results in relation to evaluations of the author's morality (combined author morality, sincerity, and honesty ratings). There was a marginally significant effect of participant sex, $F(1,140)=3.50, p=.063$, with female participants giving overall higher ratings than male participants. We found that there was a significant interaction of inclusion of a biography and inclusion of a photograph, $F(1,140)=9.34, p=.003$. There were no other significant effects. A simple effects analysis of *biography inclusion* showed that there was a significant difference in evaluative ratings based on the inclusion of a biography in the conditions that did *not* include appearance information, $F(1,75)=11.07, p=.001$, with participants rating the article more positively once there was a biography included than when there was not. However, the inclusion of a biography had no effect when a photograph was also included.

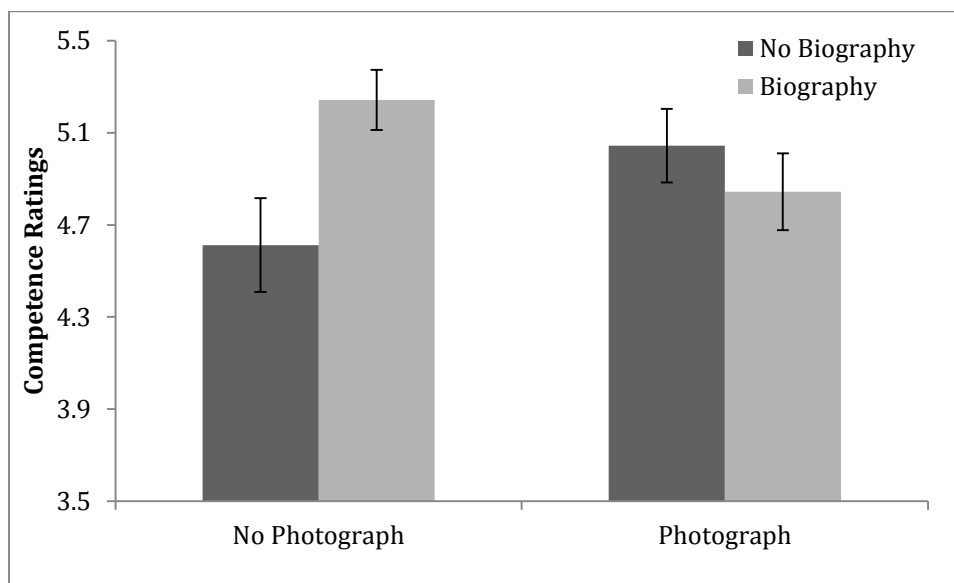


Figure 17. Author competence ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Study 2a Discussion

As predicted, photograph inclusion (i.e., the inclusion of appearance-related information) showed no direct effect on evaluative ratings, while biography inclusion (i.e., the inclusion of personhood-related information) *did* show an effect on evaluative ratings, specifically (in this case) through the enhancement of such evaluations. More important is that the author biography only showed this positive effect on evaluations of female authors and their work when a photograph was *not* included. Once a photograph *was* included, there was no difference in evaluative ratings based on the inclusion of a biography. Thus, we find that the effect of appearance information overrides that of personhood information in evaluations of women, specifically with appearance information eliminating the boost to evaluative ratings that the inclusion of personhood information provides. In other words, when both women's appearance and personhood information are included in conjunction, the effects of appearance are stronger, negating the positive effect of personhood information on evaluations.

It seems, then, that for women in the context of the public domain, information related to the body is privileged at the *direct expense* of information related to the mind in evaluations of female social audibility. However, it is still possible that this pattern is consistent across target author gender; we therefore must conduct the same study but with a male author in order to examine whether this privileging of body over mind occurs for women but not men.

Study 2b Methods

Participants

There were 204 participants (87 female, 117 male) with a mean age of 31.63 years (age range of 18-66 years). 180 of the participants described themselves as heterosexual, 8 as homosexual, 12 as bisexual, 2 as unsure/questioning, and 2 as a sexual orientation other than that listed. All participants were recruited via Mechanical Turk and received the standard monetary compensation for their time.

Stimuli

The opinion editorial and its format used in this study were the same as that used in Study 2a. The only difference was the gendered name of the author (Ethan West instead of Emma West) used at the top of the article, under the author photograph (for the conditions in which the photograph was included), and in the biography (for the conditions in which the biography was included). Additionally, a photograph of a white male was used in this study, through his image was controlled to be the same race and approximately the same age as the female photograph used in Study 2a (see *Appendix 5*).

Like the female author photograph, this author photograph was rated in a pilot study by the same 14 participants on Likert scales (1-7, where a higher score means a more positive evaluation) as significantly above average in terms of competence ($t(13)=6.50$, $p<.001$), professionalism ($t(13)=2.50$, $p=.027$), warmth ($t(13)=5.04$, $p<.001$), and likeability ($t(13)=6.90$, $p<.001$), though unlike his female counterpart he was also rated as above average in terms of attractiveness ($t(13)=3.80$, $p=.002$). Further, while there were no differences between the male author in this study and his female counterpart in Study 2a in

terms of competence, professionalism, and warmth ($p=.635$, $p=.319$, and $p=.165$, respectively), the male author was rated as more attractive ($t(13)=2.38$, $p=.034$) and more likeable ($t(13)=2.75$, $p=.017$).

Procedure.

The procedure in Study 2b is identical to that of Study 2a.

Study 2b Results

We hypothesized that unlike female targets, male targets have pre-established contextual relevance in the public domain. We therefore predict that in evaluations of male authors there will not be the dichotomous exchange between physical visibility and social audibility that we saw previously in evaluations of female authors, such that even if there is an evaluative effect of the biography being included with the article, it will not be contingent on the presence or absence of a photograph for male authors. To examine this hypothesis we used a 3-way between-subjects factorial analysis of variance (ANOVA) to explore the effects of participant sex, photograph inclusion, and biography inclusion on evaluations of the article and its author.

As predicted, we found no significant effects of any of the independent variables on either article evaluation ratings (see *Fig. 18*) or on evaluative ratings of the author's competence (see *Fig. 19*) for articles written by a male author.¹² We also found no

¹² As in Study 2a, the pattern of results across most evaluation measures is consistent with that of article evaluation and author competence ratings. As such, Figures 18 and 19 can be used as reference for evaluative measures not depicted graphically, as they show the representative pattern of results for the remaining evaluative dimensions (with the exception of author morality, to be discussed below).

significant effects on reader interpretation of the article outside of participant sex ($F(1,203)=4.95, p=.027$), with male participants giving overall higher ratings than female participants.

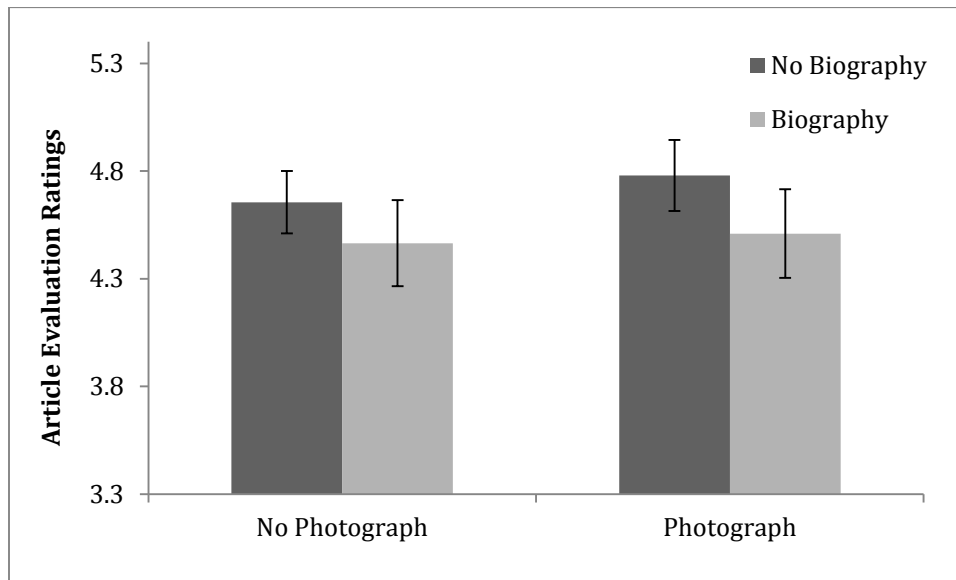


Figure 18. Article evaluation ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

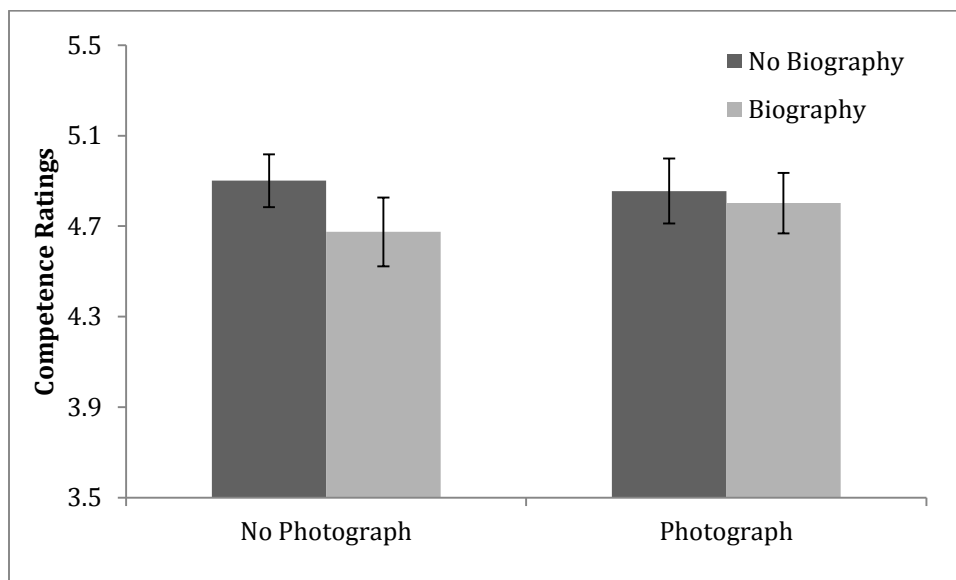


Figure 19. Author competence ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Author emotionality was the only domain in which there was a marginally significant main effect of biography inclusion on ratings, $F(1,203)=3.34$, $p=.069$, with higher ratings of the author's emotionality when there was no biography provided than when the biography was included with the article. There were no other significant effects.

Finally, an analysis of evaluations of the author's morality showed a marginally significant interaction effect of author sex with photograph inclusion, $F(1,203)=3.19$, $p=.076$. A simple effects analysis of participant sex showed that there was a significant difference in evaluative ratings based on participant sex when a photograph was included with the article, $F(1,203)=5.69$, $p=.019$, with male participants giving increased ratings of the male author's morality than female participants when a photograph was included. There was no effect of participant sex when there was not a photograph included with the article, however (see *Fig. 20*). Finally, we found no other significant main or interaction effects on author morality ratings.

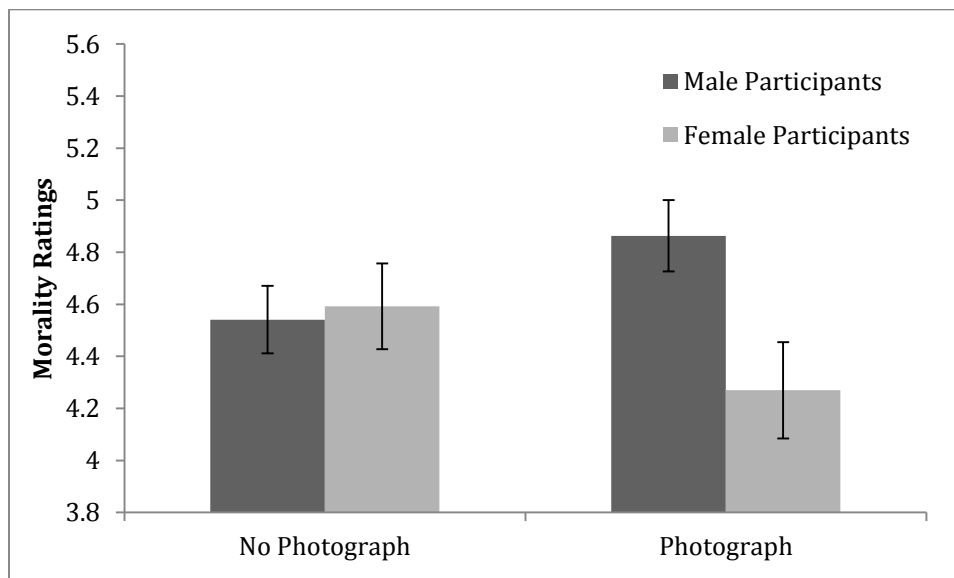


Figure 20. Author morality ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Comparison to Study 2a

We also conducted an overall analysis of the data collected in Studies 2a and 2b, primarily to determine whether there was actually a difference in the use of external author information on article evaluations based on author sex. Specifically, we predict that any effects of including the author's biography and/or photograph (as described above) will be qualified by the sex of the author, thereby leading to the differing evaluative effects that biography and photograph inclusion were found to have on female as compared to male authors (i.e., the significant interaction effect of photograph and biography inclusion in evaluations of *female* authors and the lack of such an interaction effect in evaluations of *male* authors). Additionally, we explore any potential differences in overall evaluations of female compared to male authors based on previous research showing mixed evidence of an evaluative bias favoring men and disadvantaging women (e.g., Goldberg, 1968; Swim, Borgida, Maruyama, & Myers, 1989), as well as research demonstrating a tendency to stereotype emotionally expressive traits and behaviors as feminine (e.g., Prentice & Carranza, 2002).

We therefore conducted 4-way between-subjects ANOVAs in order to examine the effects of participant sex, photograph inclusion, and biography inclusion as well as *author* sex on evaluations of the article and its author. And indeed, we found the predicted three-way interaction effect of author sex, biography inclusion, and photograph inclusion on article evaluation ratings ($F(1,346)=3.23, p=.073$); ratings of reader interpretation of the articles ($F(1,346)=5.42, p=.021$); author competence evaluations ($F(1,346)=3.84, p=.051$); and author morality evaluations ($F(1,346)=3.14, p=.077$). Only evaluations of author emotionality did not show this predicted interaction effect ($p=.242$).

In addition, we found no significant effect of author sex on article evaluation ratings, reader interpretation ratings, or author competence evaluations, with both male and female authors receiving equivalent ratings on all three of these dimensions. However, author sex had a significant effect on ratings of author emotionality ($F(1,346)=3.97$, $p=.047$) and a marginally significant effect on ratings of author morality ($F(1,346)=3.03$, $p=.082$), with participants tending to rate female authors more positively on both of these dimensions (see *Fig. 21* for average ratings based on author sex on all evaluative dimensions).

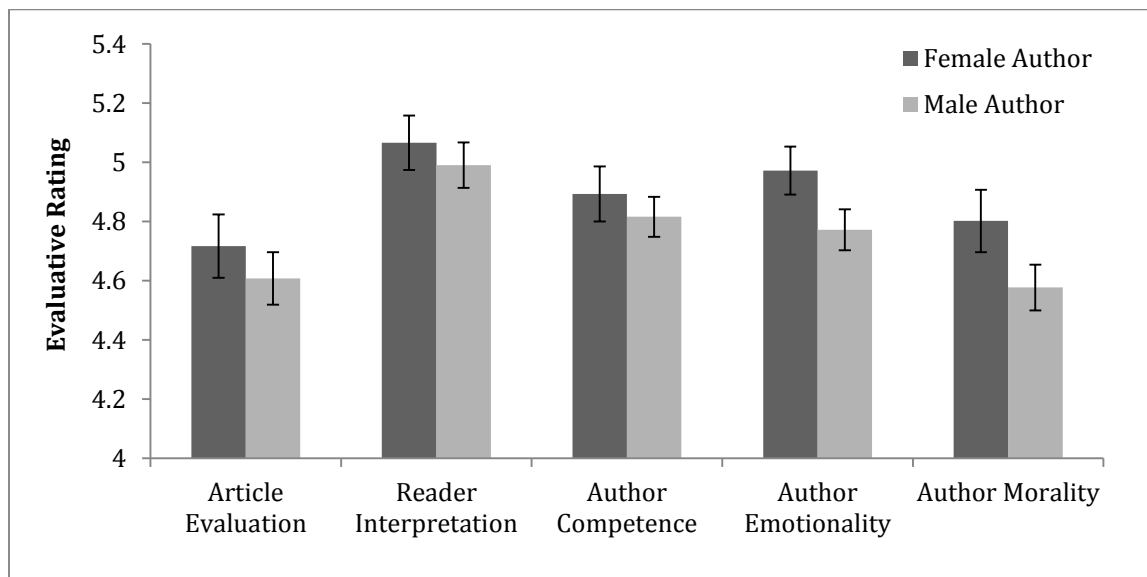


Figure 21. Mean evaluations based on author sex. Error bars are standard error.

Study 2b Discussion

Unlike in evaluations of female authors, evaluations of male authors show no such exchange in the emphasis on information related to personhood/mind or appearance/body in evaluations of their social audibility. Specifically, as men are already contextually relevant in the public domain and through their social audibility, external information related to both their personhood and appearance had no effect on evaluations of their

social audibility. This contrasts with evaluations of female authors, who do not share men's social relevance in the public domain through audibility and are therefore affected by the same types of external information, additionally with appearance information trumping the importance of personhood information in evaluative influence.

Introduction to Study 3: Replication of Studies 2a and 2b

In the next two studies, we primarily intend to replicate the results found in Studies 2a and 2b through the use of a different opinion-editorial on a new topic, as well as through the use of different author appearance and personhood information. We additionally explore the potential effects of using a more positively evaluated article, predicting that we will overall find the same trend in evaluative ratings in terms of the inclusion and/or lack of inclusion of appearance and personhood information. Specifically, we predict that evaluations of female authors will continue to show a trend toward privileging information related to the body at the direct expense of information related to the mind in evaluations of female social audibility. Meanwhile, as men are already contextually relevant in the public domain of audibility, there will be no such exchange in emphasis on information related to the mind or body in evaluations of their social audibility, as found previously.

Study 3a Methods

Participants

There were 128 participants (58 female, 70 male) with a mean age of 31.62 years (age range of 18-60 years). 115 of the participants described themselves as heterosexual, 5 as homosexual, 7 as bisexual, and 1 as a sexual orientation not listed. Two participants

were excluded from analyses because they did not provide their sex. All participants were recruited via Mechanical Turk and received the standard monetary compensation for their time.

Stimuli

All participants read the same article, an opinion-editorial espousing a pro-medical marijuana stance. The article was approximately the same length as the article from Study 1 at 6 short paragraphs (589 words), and was based on actual research on the topic. Again, the article was in standard *New York Times* format, and there were four versions of the article based on whether or not a photograph and/or biography were included (i.e., Control, Appearance Information, Personhood Information, and Appearance & Personhood Information Conditions; for an example article, see *Appendix 6*).

Here we used a different author photograph, though again we used a white female controlled to be the same race and approximately the same age as the woman featured in the photograph used in Study 2a. The author photograph in this study was also rated in a pilot study by the same 14 participants on Likert scales (1-7, where a higher score means a more positive evaluation) as significantly above average in terms of competence ($t(13)=5.79, p<.001$), professionalism ($t(13)=6.27, p<.001$), warmth ($t(13)=3.74, p=.002$), and likeability ($t(13)=6.62, p<.001$), though unlike her female counterpart in Study 2a she was also rated as marginally above average in terms of attractiveness ($t(13)=2.10, p=.055$). Further, while there were no differences between the female author in this study and the female author in Study 2a in terms of competence, professionalism, warmth, and attractiveness ($p=.131, p=.525, p=.435$ and $p=.671$, respectively), the author in this study

was rated as more likeable ($t(13)=3.05, p=.009$). In addition, we used a different author biography, towards which pilot participants expressed significantly more positive attitudes in terms of warmth ($t(7)=3.00, p=.020$) and likeability ($t(7)=2.05, p=.080$), as well as a trend toward increased ratings of competence ($t(7)=1.53, p=.170$).

In order to determine potential differences in article liking between the pro-medical marijuana article used in this study and the pro-genetically modified foods (pro-GMOs) article used in the previous study, we used participant ratings from the Control Conditions in both studies, as there was no appearance or personhood information included. We found that evaluative ratings of the pro-medical marijuana article were significantly higher than those of the pro-GMOs article across all dimensions, including: ease of reader in understanding the article, $t(67)=3.07, p=.003$; article liking, $t(67)=4.74, p<.001$; author liking, $t(66)=3.92, p<.001$; agreement with the author's opinion as expressed in the article, $t(67)=3.54, p=.001$; author knowledgeability, $t(67)=2.78, p=.007$; author insightfulness, $t(67)=3.46, p=.001$; author persuasiveness, $t(67)=2.67, p=.009$; author's writing style, $t(67)=2.39, p=.020$; author competence, $t(67)=2.68, p=.009$; author intelligence, $t(66)=2.72, p=.008$; author emotionality, $t(66)=2.35, p=.022$; author morality, $t(67)=3.37, p=.001$; author sincerity, $t(67)=3.87, p<.001$; author honesty, $t(67)=3.26, p=.002$; article quality, $t(66)=3.39, p=.001$; and desire to read another article by the same author, $t(67)=2.92, p=.005$.

Procedure.

The procedure in Study 3a is identical to that of Studies 2a and 2b.

Study 3a Results

We assessed potential differences in article/author evaluations based on the availability of the author photograph and biography along with the article itself. We hypothesize that despite the increased article and biography likeability, we will find the same pattern of results as in Study 2a. To do this, we used a 3-way between-subjects factorial analysis of variance (ANOVA) to explore the effects of participant sex, photography inclusion, and biography inclusion on evaluations of the article and its author.

We found that for article evaluation ratings, the predicted interaction of photograph inclusion and biography inclusion trended toward significance, $F(1,127)=2.73, p=.101$. There were no other significant effects. A simple effects analysis showed that there was a significant difference in evaluative ratings based on *biography inclusion* only in the conditions that did not also include a photograph, $F(1,64)=4.10, p=.047$, with participants rating the article more *negatively* when there was a biography included than when there was not (as opposed to Study 2a, in which including the biography with the article resulted in more *positive* evaluations on average). The inclusion of a biography had no effect on evaluations when a photograph was included, however (see *Fig. 22*).

We did not replicate our previous results based on ratings of reader interpretation of the article. However, we did find a significant effect of the presence of the biography on evaluations, $F(1,127)=5.09, p=.026$, with lower reader interpretation ratings given to articles when there was a biography included than when there was not (as opposed to Study 2a, in which higher ratings were given to articles when there was a biography included than when there was not). There were no other significant effects.

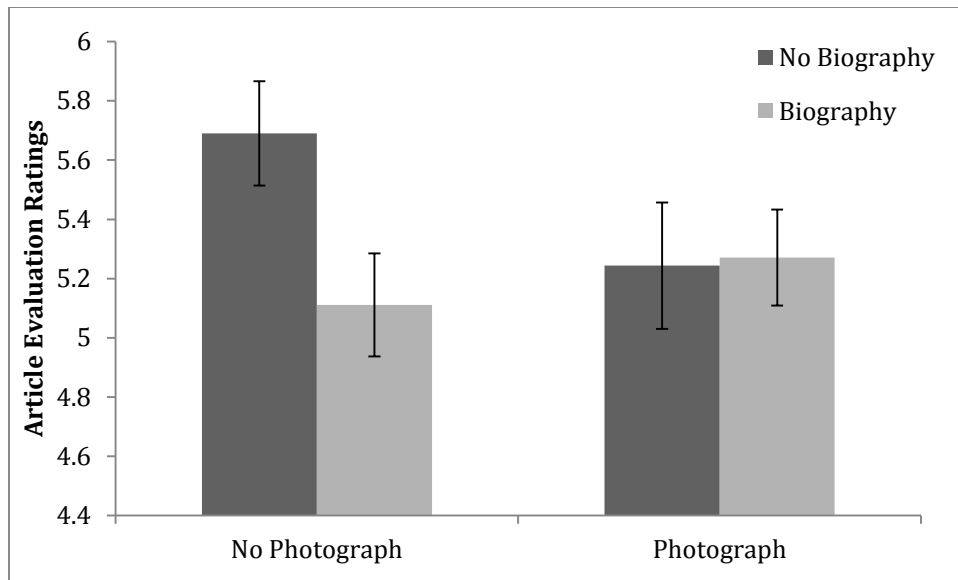


Figure 22. Article evaluation ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Based on evaluations of the author's competence, we again found that the predicted interaction of biography inclusion and photograph inclusion was marginally significant, $F(1,127)=2.72, p=.102$. There were no other significant effects. A simple effects analysis of *biography inclusion* showed that there was a significant difference in evaluative ratings based on the inclusion of a biography in the conditions that did *not* include a photograph, $F(1,64)=4.93, p=.030$, with participants rating the article more *negatively* when the biography was included than when it was not in these conditions. However, the inclusion of a biography had no effect when a photograph was included (see Fig. 23).

Finally, we found no significant results in terms of evaluations of the author's emotionality or morality, and as such did not replicate our previous results from Study 2a on these measures.

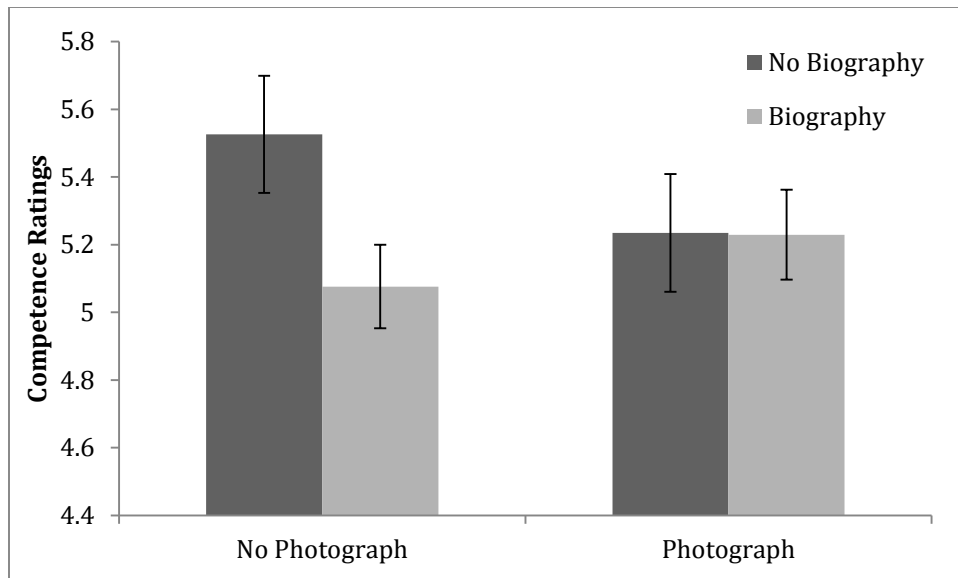


Figure 23. Author competence ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Study 3b Methods

Participants

There were 198 participants (80 female, 118 male) with a mean age of 30.93 years (age range of 18-68 years). 179 of the participants described themselves as heterosexual, 5 as homosexual, 12 as bisexual, 1 as unsure/questioning, and 1 as a sexual orientation other than that listed. All participants were recruited via Mechanical Turk and received the standard monetary compensation for their time.

Stimuli

The opinion editorial and its format used in this study were the same as that used in Study 3a. The only difference was the gendered name of the author (Samuel Thompson instead of Samantha Thompson) used at the top of the article, under the author photograph

(for the conditions in which the photograph was included), and in the biography (for the conditions in which the biography was included). Additionally, a photograph of a white male author was used in this study, through his image was controlled to be the same race and approximately the same age as the woman depicted in the photograph used in Study 3a (see *Appendix 7*).

This author photograph was rated in a pilot study by the same 14 participants on Likert scales (1-7, where a higher score indicates a more positive evaluation) as significantly above average in terms of competence ($t(13)=7.79, p<.001$), professionalism ($t(13)=8.53, p<.001$), warmth ($t(13)=3.74, p=.002$), and likeability ($t(13)=4.84, p<.001$), though unlike his male counterpart in Study 2b he was not rate as above average in terms of attractiveness ($t(13)=1.53, p=.150$). Further, while there were no differences between the male author in this study and the male author in Study 2b in terms of warmth and likeability ($p=.263$ and $p=.263$, respectively), the author in this study was rated as more competent ($t(13)=5.08, p<.001$) and more professional ($t(13)=3.99, p=.002$), though he was also rated as less attractive ($t(13)=-2.69, p=.019$). Additionally, while there were no differences between the male author in this study and the female author in Study 3a in terms of warmth, attractiveness, and likeability ($p=1.00, p=1.00$, and $p=.208$, respectively), the author in this study was rated as more competent ($t(13)=3.12, p=.008$) and more professional ($t(13)=3.12, p=.008$).

Procedure

The procedure in Study 3b is identical to that of Studies 2a, 2b, and 3a.

Study 3b Results

We assessed potential differences in article/author evaluations based on the availability of the author photograph and biography along with the article itself. We predict that despite the increased article and biography likeability, we will find the same pattern of results as in Study 2b. To examine this hypothesis we used a 3-way between-subjects factorial analysis of variance (ANOVA) to explore the effects of participant sex, photograph inclusion, and biography inclusion on evaluations of the article and its author.

As predicted, we found no significant effects of any of the independent variables on article evaluation ratings (see *Fig. 24*). Similarly, there were no significant effects on reader interpretation¹³ of the article outside of participant sex, $F(1,197)=5.00, p=.027$, with female participants giving overall higher ratings than male participants. This same pattern was found in ratings of author's competence, with a significant effect of participant sex ($F(1,197)=5.38, p=.021$) in which female participants gave higher competence ratings than male participants, though there were no other main or interaction effects (see *Fig. 25*).¹⁴

Ratings of the author's emotionality and morality again showed an effect of participant sex on evaluative ratings ($F(1,197)=4.74, p=.031$ and $F(1,117)=3.31, p=.071$, with significant and marginally significant effects of participant sex on emotionality and morality ratings respectively), with higher ratings given by female as compared to male

¹³ Again, as the pattern of results for reader interpretation evaluations is the same as that for general article evaluations, no graphical depiction of reader interpretation is included. However Figure 24 (general article evaluations) can be used as reference here, as it depicts an identical pattern of results.

¹⁴ As in previous studies, because the pattern of results across all author evaluation measures is consistent with that of author competence, no graphical depictions of evaluations of author emotionality or morality are included here. However Figure 25 (evaluation of the author's competence) can be used as reference for the remaining author evaluation measures, as it depicts a representative pattern of results.

participants. As predicted, there were no other significant main or interaction effects for ratings of both author emotionality or morality.

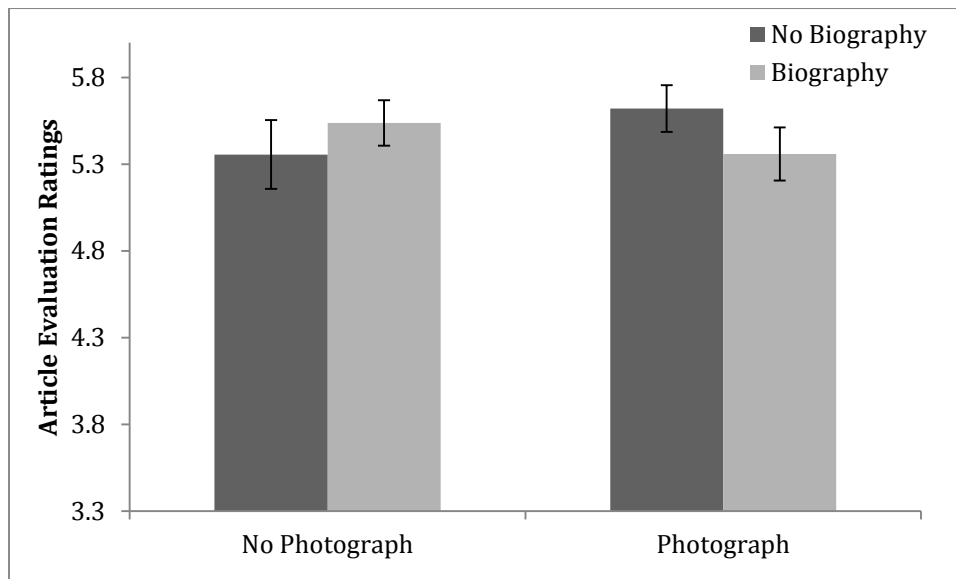


Figure 24. Article evaluation ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

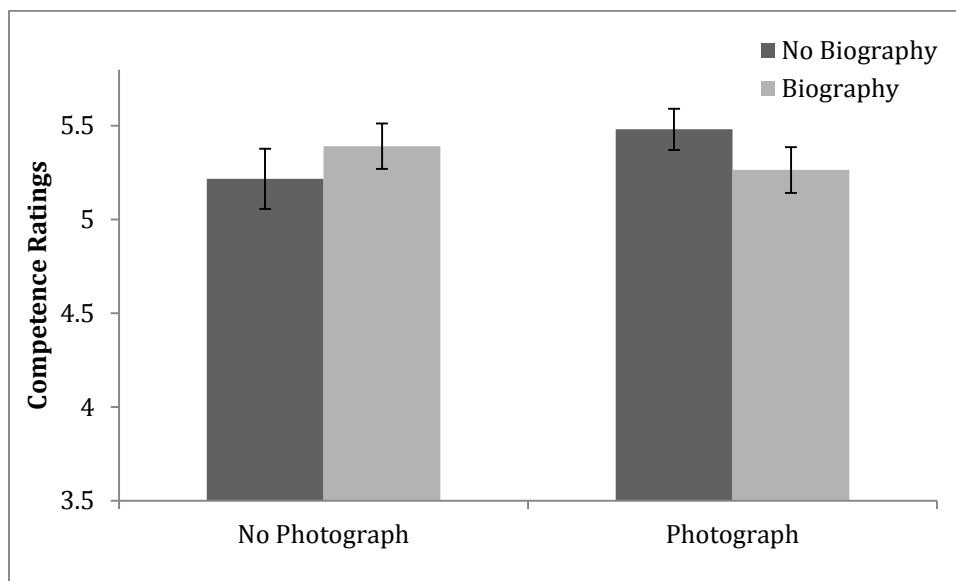


Figure 25. Author competence ratings based on the inclusion of a photograph and a biography with the article. Error bars are standard error.

Studies 2a, 2b, 3a, & 3b Discussion

Overall, we find a consistent pattern of results across all four article evaluation studies: That while evaluations of women's social audibility are affected by external information, the same is not true for men. As women are not typically relevant in the public sphere, in particular through their audibility, it stands that external information is useful and relevant in hearing what they say. Further, as their relevance is more closely associated with the body, it follows that information related to the body is privileged at the direct expense of information related to the mind in these evaluations of their social audibility. However, as men already hold normalized contextual relevance in the public sphere, acknowledging their social audibility is overall not contingent on external information in the same way that it is for women. Instead, there is no exchange in emphasis on information related to mind or body in such evaluations of their social audibility.

Of note is that the results from Study 3a seem to replicate those of Study 2a, albeit with an inverted (as well as weaker though still consistent) outcome pattern. In this study the inclusion of personhood information resulted in more *negative* evaluations of the article and its female author, as opposed to the previous study in which the inclusion of personhood information lead to more *positive* evaluations. However, what is of primary importance is that the general *pattern* of results remained the same, with the inclusion of personhood information affecting evaluations only when appearance information was not also included. In Study 2a, personhood information functioned to increase evaluative ratings, an effect that was negated by the overriding influence of appearance information. Meanwhile in Study 3a, personhood information decreased evaluative ratings, but this

effect was similarly overridden by the inclusion of appearance information. In both studies, regardless of the *direction* in which personhood information drove evaluative ratings, the effect of appearance information consistently overrode and negated that of personhood information in evaluations of women and their performance in a public domain of opinion expression.

General Discussion

“Social invisibility” is the term commonly applied to the problematic cultural discrepancy in the relevance and representations afforded to marginalized social group members compared to the universal subject. Yet in describing the limited social relevance and representations afforded specifically to *women*, “invisibility” seems to be something of a misnomer. Instead, the limited relevance women do gain is often through their physical visibility rather than their social audibility, and female representational repertoires tend to consist of women as visible and often eroticized bodies rather than as audible minds with the power to exert agentic social influence beyond that of a passive physical presence. In short, women’s “social invisibility” consists (at least in part) of an exchange of being seen for being heard, of being physically visible for being socially audible.

Evidence for this pattern of female relevance arises in tracking the attentional focus directed selectively toward observed men and women across different public contexts. Like previous research we found that women are hyper-visible, with their mere physical presence attracting more visual attention than men’s physicality. Yet female attentional relevance in the public domain is *conditional*, contingent on women gaining attention through their physicality alone. Once the public context shifts from one of exclusively

physical visibility to one that additionally includes the potential for social audibility, perceiver attention also shifts away from women. The same is not true for men, however, who are consistently relevant in the public domain regardless of the inclusion or exclusion of potential audibility. Men thereby maintain the attentional focus of perceivers despite the contextual shift toward audibility, even though women do not. Thus, our initial eye tracking research lends support for our assertion that women's representational repertoires in the public sphere include representations (and thereby relevance) based on physicality/their bodies but not social audibility/their minds.

Seemingly in contradiction to these findings, though, is that in a context of *actual* (as opposed to merely potential) audibility perceivers directed more attentional focus toward female rather than male speakers, implicating similarly increased female relevance in a context of audibility through voice. Yet in light of our previous results demonstrating decreased perceiver expectation for female speech (as evidenced by the attentional shift away from women once interview questions were posed and responses from target interviewees were awaited), we propose that the conversely increased attentional focus given to female speakers arises due to *surprise* that they are responding to questions in the place of male speakers. Indeed, perceivers' source memory for female compared to male speakers suggests that surprise rather than relevance drives the increased visual fixation on women while they are speaking. As increased attention is typically related to an increase in memory for the attentional target, we would expect that if female speakers are actually more relevant based on the increased sensory attention granted to them during speech, then there should also be further cognitive processing of—and thereby greater memory for—women as speakers. Instead, despite this increased attendance to female

speakers, there is still decreased memory for women's assertions of audibility, with more of women's than men's speech misattributed. Additionally, the standard relationship between increased attention and corresponding increased memory exists only in instances of male audibility, while for women memory of their audibility is unrelated to the amount of visual attention paid to them during speech. Women are therefore not more *relevant* but instead more *unexpected* as speaking subjects in a context of social audibility through assertion of mind, and are thus less likely to have the contents of their voice attributed to them in subsequent instances of recall by perceivers. Further, the visual attention they receive while speaking does not seem to be related to their speech itself.

Yet while women are less memorable and relevant as audible subjects, there is no gender difference in memory for the actual *content* of speech, with perceivers remembering statements made by male and female speakers at equivalent rates. This is not to say that there is no difference in perceptions of male and female audibility, however; to the contrary, differences in perceptions of speech content based on the gender of the speaking subject are evidenced not through memory for but rather through *evaluations of* audibility. The comparative lack of female relevance in a public audibility context results in evaluations of a woman's assertions of mind that are based not exclusively on her speech content but also on external information about the speaker herself. Further, these evaluations demonstrate that public relevance for women involves a *dichotomous relationship* of physical visibility and social audibility, such that the increased privileging of female bodies comes at the direct expense of the relevance of female minds. In contrast men, who are contextually relevant in the public sphere as well as based on their audibility, tend to be evaluated based on speech content alone without any reliance on external

information related to speaker appearance or personhood. As found previously through our results on attentional directing, there is no exchange of physical visibility for social audibility or vice versa in evaluating men and the male voice. These findings reflect assertions that “women are allowed a mind or a body but not both” while men are not required to make such an exchange in informational relevance (Wolf, 1990, p. 43), demonstrating that the consequence of focusing on women’s bodily physicality comes at the direct expense of the audibility of their minds.

Future Directions

These results still only touch upon the surface of issues surrounding female domains of social relevance, however. If as we propose women’s representational repertoires are located primarily in the private sphere, then their potential areas of contextual relevance should extend beyond that of their bodily physicality to other domains related to the private sphere as well, such as through nurturing and other interpersonally-oriented activities. Already research on gender stereotypes and attitudes has found that the roles, occupations, attributes, and traits that are considered stereotypically feminine and related to women tend to revolve around the private sphere (e.g., Deaux & Lewis, 1984; Eagly & Mladinic, 1989; Eagly & Steffen, 1984). Within our own eye tracking and memory paradigm, then, we would predict that perceivers will selectively attend to and remember women over men within a context of answering questions about comfort, nurturance, relationships, or other stereotypically feminine-typed activities rather than in the more gender-neutral (albeit still instrumental and public) context used in our current research.

Our model of decreased female social relevance and noticeability also proposes not only that women qualify as a “socially invisible” group, but also that their lack of relevance manifests in a unique manner—specifically, that women are less socially relevant based on an increased focus on female physical visibility at the expense of female social audibility. However, another possibility is that universal subjects (i.e., white men) always have a less noticeable physical presence (based on their over-representation) but a more noticeable social presence (based on their contextual relevance). As such, what they *say* (social audibility) is more important and informative than how they *look* (physical visibility). Minority group members, on the other hand, may have a more noticeable physical presence (based on their under-representation) but a less noticeable social presence (based on their contextual irrelevance). Perhaps, then, the physicality of *all* socially invisible minority group members (rather than only women, as previously proposed) overrides that of their audibility, simply because their physical presence is more noticeable than other aspects of their social presence. This counters our hypothesis that women are uniquely socially invisible through the emphasis on their physical visibility over their social audibility and other aspects of their social presence. To test this potential oppositional hypothesis, it would be useful to replicate all of our studies using members of another minority group (e.g., black men) in order to ensure that our findings of women’s lack of social relevance arises due to their representational repertoires being limited to aspects specifically related to their being *female* rather than due to their general minority status.

In considering other minority groups beyond women, it is also important for us to consider whether our results apply to more than only *white* women. Feminist discourse and criticism problematizes much of the discussions and research on sexism by pointing

out their focus on exclusively upper- and middle-class white women, without attention given to the specific social standings and struggles of minority women with intersecting marginalized identities (e.g., Reid & Comas-Diaz, 1990). As our own research similarly focuses on the social relevance of white women while more broadly discussing the situation of women in *general*, follow-up research should focus on whether or not the social relevance and representational repertoires of minority women follow a similar pattern to that of white women, as found in our studies here. Indeed, some research suggests that women belonging to different race/ethnic groups may not gain social relevance in the same way as white women. For example, Sesko & Biernat (2010) found in their own research on social invisibility that photographs of black women's faces were actually *less* memorable than the faces of those belong to other social groups. Therefore before we can generalize our findings in relation to white women's social relevance and representational repertoires to women in general, we must also conduct similar research in relation to women with intersecting minority status identities.

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Appendix 1

Full script of Skype movie audio, with 13 interview questions and their related answers.

Statement	Script Statements
Question 1	Do you feel they ask a lot of the same questions at job interviews?
Answer 1	Yeah they do, 'Tell me a little about yourself,' is always the first question.
Answer 2	I've been asked a few times what I would do if I had a problem with a co-worker.
Answer 3	The one I always get stuck on is when they ask about your worst qualities.
Question 2	What tactics do you use to come across as confident rather than nervous during interviews?
Answer 4	I found good eye contact helps me come across as competent and confident in my abilities, even when I'm not.
Answer 5	There's a fine line between confident and arrogant, though. It's a toss up, you don't want to be shy either.
Question 3	Do you have a preference for in-person or phone interviews?
Answer 6	I definitely prefer phone interviews. You can have notes on how to answer and they never know!
Answer 7	Yeah but phone interviews are so awkward—you never know what they think of you when you're done.
Answer 8	At least you can hide your nervousness. I do sometimes think it's hard to make a good impression on the phone though.
Answer 9	The same with in-person interviews. You can think you're good at something, but sometimes it doesn't show in the interview.
Question 4	How about when interviewers ask about salary expectations?
Answer 10	This one's really hard because I've never had a real job before!
Answer 11	Yeah, it can be difficult. I find knowing what similar jobs pay is a good starting place.
Question 5	What do you find is the best way to respond to interview questions about the company with which you're interviewing?
Answer 12	Doing some research in advance on the company you're applying to is never a bad idea.
Answer 13	You always want to sound interested and suited for the company, but not overeager.
Answer 14	A friend of mine told me he didn't get a job because he liked the company too much and seemed too desperate.
Question 6	Generally speaking, what is appropriate attire of a job interview?
Answer 15	If you're not sure, you can always find out how employees at the company tend to dress and choose your outfit based on what fits in with the company culture.
Answer 16	That's true, but I think it's important to dress professionally even if you find out that other employees there dress casually. You want to look like you care about the job you're applying for.
Question 7	Have you ever had to deal with any sort of sexual harassment during an interview, and if so, how did you deal with it?
Answer 17	I've never personally dealt with harassment in an interview, but my friend did once. She said it caused her to lose some of her confidence and made her really

	uncomfortable.
Answer 18	It can take you off guard, but I've found that the best way to deal with harassment is to just ignore it, if you can.
Answer 19	I think if you're already getting harassed at your interview, you may want to reconsider working at that company! Some places foster a climate where sexual harassment is an acceptable practice, and you don't want to be stuck in that.
Question 8	What do you do if you're asked a question to which you don't have an answer?
Answer 20	Sometimes I'll ask them to repeat the question, to give myself a little more time to think.
Answer 21	Just try to come up with the best answer you can. Sometimes you'll even come up with something while you're talking!
Question 9	What do you think is most important to do in preparing for a job interview?
Answer 22	Researching the company and having some questions to ask about it seems to come across well.
Answer 23	And on top of that, learning the specifics of the job you're applying for—that way you know what the relevant work experience and qualifications are.
Question 10	What is the best way to demonstrate you have the sufficient amount of experience for the position you're after?
Answer 24	You should let your resume do the talking for you. I make sure mine is complete and detailed before I even walk into the interview, with all my experience accounted for.
Answer 25	A resume only gets you so far, though. I like to tell a few stories that demonstrate the work I've done and the experience I have.
Question 11	What do you do if the interviewer asks you a "trick" question or gives you an unexpected task?
Answer 26	Provide an equally surprising answer or solution. They ask questions like that to see how quickly you think on your feet.
Answer 27	The most important thing is to stay calm and take your time. Employers are looking for people who can keep their head in an unexpected situation.
Question 12	How early do you tend to show up to your interviews?
Answer 28	I always arrive right on time. It's important to be punctual without seeming nervous or desperate.
Answer 29	I make a point of getting to the interview at least five minutes early. It gives me time to prepare myself mentally, and shows that I'm serious about the job.
Answer 30	It's always better to be early—nothing looks worse than being late to a job interview.
Question 13	Do you have any last general advice you would give to students applying to the job market this upcoming year?
Answer 31	Don't be too intimidated by the current job market—there will be something out there for you!
Answer 32	You always want to tailor your resume and interview answers to the job, but make sure some of your real self comes through. You don't want to end up looking like everyone else, or working somewhere that isn't right for you.

Appendix 2
List of speaker order and speaker sex based on condition.

Statement Number	Condition 1		Condition 2	
	Speaker #	Speaker Sex	Speaker #	Speaker Sex
1	1	Female	1	Male
2	2	Male	2	Female
3	3	Female	3	Male
4	4	Male	2	Female
5	5	Female	4	Male
6	6	Female	5	Male
7	7	Male	6	Female
8	8	Male	7	Female
9	3	Female	3	Male
10	1	Female	5	Male
11	8	Male	8	Female
12	4	Male	8	Female
13	6	Female	5	Male
14	5	Female	4	Male
15	3	Female	4	Male
16	6	Female	5	Male
17	1	Female	3	Male
18	5	Female	1	Male
19	2	Male	8	Female
20	4	Male	2	Female
21	7	Male	7	Female
22	8	Male	2	Female
23	7	Male	8	Female
24	5	Female	1	Male
25	8	Male	6	Female
26	2	Male	6	Female
27	1	Female	3	Male
28	7	Male	7	Female
29	2	Male	6	Female
30	6	Female	1	Male
31	4	Male	7	Female
32	3	Female	4	Male

Appendix 3

Written version of instructions given to participants at the beginning of the experiment.

In this study, you will be listening to a focus group discussion held over Skype amongst college seniors discussing how to deal with job interviews after graduation. During the discussion, an interviewer will ask the students various questions, to which the students will respond with their opinions about job seeking and interviews.

For you to best be able to hear the conversation, all background noise and interruptions have been filtered out of the recorded dialogue. Additionally, though the discussion group was recorded with still photographs and audio only, the Skype interface will indicate which student is speaking by highlighting the speaker's photograph with a blue outline.

Please listen closely to the focus group discussion. In the discussion, the participants of the focus group will first introduce themselves. Following these brief introductions, the actual focus group discussion will begin. After listening to the discussion, you will be asked for your own opinions about job seeking post-graduation, as well as about how useful you think the advice given by each of these focus group participants is for you and other college students.

Appendix 4

Opinion editorial article from Appearance & Personhood Condition in Study 2a.

OP-ED COLUMNIST

Genetically Modified Foods: Choosing Feast over Famine

By EMMA WEST

Published: March 17, 2013

Genetically modified foods have been a contentious issue since their conception. Activists have been known to sabotage fields of genetically modified crops, often claiming that altered crops and food are bad for human health, pose a risk to more “pure” strains, and contribute to deforestation and global warming. And they do this by distorting the science on GMOs with research showing that genetically modified foods are not only safe for consumption, but are better, not worse, for the environment.



Bert Bertman/The New York Times

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As of today, 70-percent of the world’s soybean crop is genetically modified. Much of it is used for animal feed, and it is usually modified to make it resistant to herbicides and pests.

Using the genetically modified version of crops, therefore, spares farmers the expense of pesticides, and brings greater profits as their crop yield increases on average. The environment benefits, too, from the crops’ pesticide-free, “no-till” farming, which releases less greenhouse gas than alternative methods and reduces soil erosion. The anti-GMO views of Europe have even encouraged deforestation in South America; through demand of non-genetically engineered soy products for use in EU livestock sectors, market pressures have encouraged the cultivation of non-genetically modified soybeans on newly-cleared land in Brazil specifically because it is more remote from the mainstream soy-producing states where genetically-engineered soybean production dominates, in order to avoid “contamination” by the latter.

Monsanto, a company which engineers and produces genetically-modified foods, has often received the brunt of anti-GMO criticism. By marrying conventional breeding with genetic engineering, they have produced more food for less money on the same amount of land. This is an especially important feat at a time when there is a bigger demand for food than ever but no new farmland. They have also ensured that pests, weeds, drought, and other problems

won’t destroy a crop’s potential. They have created plants that can survive even in the toughest climates, offering a potential solution to climate change-associated famine. They allow us to answer the question of, “How are we going to feed everybody?”

Yet even while Monsanto has been working to make humanity better fed, it has been the object of vicious criticism. In the first round of attacks the company was portrayed as the Satan of agriculture for daring to modify the genes in corn and soybeans. That people have been selecting plant genes for 5,000 years was no defense; Monsanto’s gene-splicing threatened the world with ecological catastrophe. In 2002 Zambia, during a famine, rejected a cargo of donated corn because it might have been tainted with offending GM seeds. Much of Europe, while still forbidding the planting of GM crops, permits the importation of foods made from them.

With GMOs, world hunger is preventable. Plants could grow in even the harshest conditions. In starving countries, crops could be enriched with nutrients that their people otherwise could not access. Yet activists continue to fight against GMOs with arguments not based in science but on a distrust of the unknown—a distrust of what they don’t understand.

Emma West is a writer and columnist for the New York Times, after serving for eight years as a professor at the University of Southern California School of Journalism. In her spare time, she enjoys traveling, bass fishing, and learning how to bake new desserts.

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Appendix 5

Opinion editorial article from Appearance & Personhood Condition in Study 2b.

OP-ED COLUMNIST

Genetically Modified Foods: Choosing Feast over Famine

By ETHAN WEST

Published: March 17, 2013

Genetically modified foods have been a contentious issue since their conception. Activists have been known to sabotage fields of genetically modified crops, often claiming that altered crops and food are bad for human health, pose a risk to more “pure” strains, and contribute to deforestation and global warming. And they do this by distorting the science on GMOs with research showing that genetically modified foods are not only safe for consumption, but are better, not worse, for the environment.



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Appendix 6

Opinion editorial article from Appearance & Personhood Condition in Study 3a.

OP-ED COLUMNIST

Putting an End to Reefer Madness

By SAMANTHA THOMPSON

Published: March 17, 2013

Marijuana is now legal under state law for medical purposes in 16 states and the District of Columbia, encompassing nearly one-third of the American population. More than 1,000 dispensaries provide medical marijuana; many are well regulated by state and local law and pay substantial taxes. But though more than 70-percent of Americans support legalizing medical marijuana, any use of marijuana remains illegal under federal law.



Bert Bertman/The New York Times

Samantha Thompson

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Over the past year, federal authorities appear to have done everything in their power to undermine state and local regulation of medical marijuana, warning that cannabis' ability to provide relief for certain some conditions, such as lupus and anxiety, remains unproven. So what? Are we to believe that because marijuana may not work as a medicine for everyone that this somehow negates the reality that it is a safe and effective agent for those people suffering from conditions for which it has been proven to help? Imagine if we were to judge other medications by this same, unrealistic standard.

Many of those who oppose medical marijuana also express concern that some individuals may be violating the spirit of California's medicinal cannabis law simply "to get high," or might begin to abuse cannabis by consuming it chronically. However, statistically speaking, most of the estimated 100 million Americans who have experimented with pot do not fall into this category or use it problematically. Opponents also warn that marijuana use may in some instances exacerbate certain psychiatric disorders. Yet on this matter the available data remain inconclusive at best. Notably, several recent studies indicate that cannabis probably plays little or no role in the precipitation of disorders such as schizophrenia, while others indicate that marijuana may be helpful in patients with depression or suicidal thoughts.

This is not to say that marijuana is without risk. It most certainly isn't. However, concerns regarding cannabis' relatively minor risk potential are hardly persuasive arguments for maintaining its illegality. There are also numerous adverse health consequences associated with alcohol, tobacco and prescription pharmaceuticals -- all of which are far more dangerous and costlier to society than cannabis -- and it's precisely because of these consequences that these products are legally regulated and why their use is restricted to particular consumers and specific settings. A pragmatic regulatory framework that allows for the limited, licensed production and sale of cannabis to adults, but continues to restrict consumption among young people, would best reduce any risks associated with its use or abuse.

Likewise, regulation would also positively address those risk factors largely associated with the substance's criminal prohibition rather than the plant itself. For example, the marijuana sold on the streets and even within some California dispensaries is often of unknown purity and quality. Further, street dealers who engage in marijuana sales are typically criminal entrepreneurs who may also introduce consumers to other, more potent illicit substances. Finally, the black-market inflated price of cannabis exposes its producers and consumers to potential crime and theft from other criminal entities looking to exploit the drug's prohibition-inflated economic value. Each of these potential risks would be mitigated, if not eliminated, under a system of cannabis legalization and regulation.

The medicinal efficacy of marijuana, like any medicine, depends on the patient and the circumstances. Cannabis is no doubt therapeutic for some but not necessarily appropriate for everyone. Can cannabis be abused? In some limited instances, yes. Nonetheless, the overwhelming majority of consumers use it responsibly and in moderation. Isn't it about time our laws and public policies reflected this reality?

Samantha Thompson is a writer and columnist for the New York Times, after serving for eight years as a professor at the University of Southern California School of Journalism. In her spare time, she enjoys listening to music, woodworking, and spending time with her children.

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Appendix 7

Opinion editorial article from Appearance & Personhood Condition in Study 3b.

OP-ED COLUMNIST

Putting an End to Reefer Madness

By SAMUEL THOMPSON

Published: March 17, 2013

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