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THE EFFECT OF BEARING SOLO STATUS WITHIN AN APPLICANT POOL ON NEWLY HIRED FEMALES' COGNITIONS, AFFECT, AND BEHAVIOR

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THE EFFECT OF BEARING SOLO STATUS WITHIN AN APPLICANT POOL ON NEWLY HIRED FEMALES' COGNITIONS, AFFECT, AND BEHAVIOR

By

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ABSTRACT

THE EFFECT OF BEARING SOLO STATUS WITHIN AN APPLICANT POOL ON NEWLY HIRED FEMALES' COGNITIONS, AFFECT, AND BEHAVIOR

By

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The process by which bearing solo status within one's applicant pool affects newly hired females' cognitions, affect, and behavior (including the presence of individual difference variables that may moderate the relationship) has not yet been specified. However, existing bodies of work (on solo status and stereotype threat) collectively yield points of theoretical convergence from which a framework can be developed. Such a framework was developed and then used (along with Heilman's research on preferential selection) to propose a model of the relationship between bearing solos status within an applicant pool and the cognitions, affect, and behavior of females recently hired for a traditionally masculine job. Study results are used to provide recommendations for future research and practice.

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THE EFFECT OF BEARING SOLO STATUS WITHIN AN APPLICANT POOL ON NEWLY HIRED FEMALES' COGNITIONS, AFFECT, AND BEHAVIOR

An increasing number of women are gaining employment in jobs historically occupied by men, such as managerial and professional positions (Amott & Matthaei, 1996; Burke, 1996; Federal Glass Ceiling Commission, 1995; Powell, Butterfield, & Parent, 2002). In such cases, these women may be the only female in an otherwise male applicant pool. This condition – being the only member of one's social category in an otherwise homogenous group – is referred to as bearing *solo status* (Lord & Saenz, 1985). The effect of bearing solo status within an applicant pool on solos' thoughts, feelings, and actions of newly hired females remains largely unexplored. Thus, the purpose of this study was to develop and test a model of the relationship between bearing solos status within an applicant pool and the cognitions, affect, and behavior of females recently hired for a traditionally masculine job.

Three streams of research address this issue. First, early qualitative research by sociologist Rosabeth Moss Kanter (1977a; 1977b) suggests women working in predominately masculine environments experience greater visibility and scrutiny of their work as well as confinement to stereotypic conceptions, ultimately resulting in lower job performance. Empirical research since then has found general support for Kanter's contention that being a solo is a negative experience (e.g., Lord & Saenz, 1985; Niemann & Dovidio, 1998; Sekaquaptewa & Thompson, 2002; c.f., Fuegen & Biernat, 2002). Unfortunately, the solo status literature remains plagued with what Lawrence (1997) termed "black box" studies, which do not measure intervening process variables, and thus

there is currently no clear model of the solo status phenomenon (e.g., Riordan, 2000; Sekaquaptewa & Thompson, 2003; Young & James, 2001).

Second, Claude Steele and his colleagues recently introduced the concept of *stereotype threat* – loosely defined as the pressure an individual faces when at risk of confirming a negative, self-relevant group stereotype (Steele & Aronson, 1995). These researchers have suggested that bearing solo status may prompt stereotype threat, resulting in "underperformance" (e.g., Steele, Spencer, & Aronson, 2002). Steele and Davies (2003) claim the basic tenant of this line of research – stereotype threat undermines test performance – "has been shown in multiple groups, on many tests, in laboratory and real-life testing situations, in many countries, by many different investigators, in published experiments that now approach 100 in number" (p. 312). Unfortunately, the knowledge of the effects of stereotype threat may have been acquired at understanding the phenomenon itself, as there are currently an abundance of features suggested to characterize the threat (Wheeler & Petty, 2001) and a conspicuous absence of any model that integrates them.

Finally, Madeline Heilman and her colleagues' research (Heilman, 1980; Heilman & Alcott, 2001; Heilman & Blader, 2001; see also Heilman & Haynes, in press) addresses solo status in a selection context and thus is a helpful supplement to the preceding two literatures despite the fact that it primarily focuses on others' perception of the solo (rather than on the solos themselves). Heilman and Blader's (2001) results (see also Heilman, 1980) suggest that females bearing solo status within a cohort of newly hired individuals are perceived by co-workers to be beneficiaries of gender-based preferential selection as well as less competent and less likely to succeed (relative to non-

solo females). Related, the results of Heilman and Alcott (2001) suggest that females who are aware that their co-workers' assume they were preferentially selected tend to make more "timid, performance-limiting task decisions" (relative to those who assumed they were selected based on merit), particularly if they had low initial self-confidence about their ability to perform the task at hand (p. 574). In short, Heilman and her colleagues' research suggests the previously untested possibility that bearing solo status within an applicant pool may prompt newly hired females to believe that others will view them as preferentially selected, which may in turn negatively affect achievement.

Thus, to summarize, none of these three streams of research individually explains the process by which bearing solo status within an applicant pool affects newly hired females (including the presence of individual difference variables that may moderate the relationship). However, the solo status and stereotype threat literatures collectively yield points of theoretical convergence from which a framework can be developed. Thus, after providing a review of both literatures, I develop such a framework and then use it (along with Heilman's research) to develop a specific and testable model of the relationship between bearing solo status within an applicant pool and the cognitions, affect, and behavior of females recently hired for a traditionally masculine job. In this way, I use the general tentative framework to derive theoretically defensible predictions for the present research question and to provide a greater understanding of the literatures from which I drew in its development.

CONSTRAINTS AND CAVEATS

The purpose of the present study was to examine the effects of bearing solo status within an applicant pool on the cognitions, affect, and behavior of females hired for a job traditionally considered "masculine." Thus, although I cite that fall outside of these boundary conditions, the model that is eventually proposed applies only to situations that fall within them.

References to the effects of "bearing solo status" are references to the effects of "knowing that one bears solo status" (rather than the condition of solo status itself). This caveat is not unique to the solo status literature, as it applies to most (if not all) studies of solo status, but it is important to the present study because the demographic make-up of one's applicant pool is not necessarily apparent to the applicants themselves. This caveat and the aforementioned boundary conditions collectively imply that the model that is eventually proposed applies only to situations in which the relevant applicants are *aware* that they bore solo status within their applicant pool.

Solo applicants may discover their solo status through a variety of methods. Empirical research on the topic is lacking, but there is anecdotal evidence to support this claim. For example, Ms. Sunalini Menon, a coffee quality control expert recently named by her industry's trade journal as one of the "People of the Year," realized she bore solo status within her applicant pool when she arrived for an interview with the Coffee Board of India (Suryanarayanan, 2002). Similarly, Dr. Karen Vierow was aware that she bore solo status within her applicant pool for an assistant professorship at Purdue University's School of Nuclear Engineering when this "distinction" made her the subject of a local newspaper article (Jester, 2000).

References to females as "bearing lower social status" do not reflect the belief that women are inferior but rather that stereotyping and preconceptions about women's abilities and suitability for "masculine" jobs are among the barriers to advancement for professional and managerial women (Mattis, 1994; Morrison, 1992). This caveat is consistent with the idea that professional and managerial women face a *glass ceiling* (a subtle yet strong barrier that prevents women from moving up to senior levels of management) that limits their advancement to top management in large organizations (Burke, 1996, p. 205; Morrison & von Glinow, 1990; Morrison, White, & Van Velsor, 1987).

RELEVANT RESEARCH

Solo Status

As stated previously, Kanter's (1977a; 1977b) seminal work laid the foundation for current research on the experience of being a "token" or bearing "solo status" within organizational contexts. Kanter defined *tokenism* in terms of numbers, with any social group that represents less then 15% of the total group called "tokens." *Solo status* is a more specific case of tokenism and is defined as being the only member of one's social category in an otherwise homogenous group (Lord & Saenz, 1985). Whether a token or a solo, Kanter suggests that salient minorities experience a greater sense of visibility and thus these terms are sometimes used interchangeably. For example, Saenz and Lord (1989) refer to the condition of solo status as a case of tokenism (e.g., he was a "token by virtue of being the only man," p. 699), while Sackett, DuBois, and Wiggens Noe (1991) refer to both conditions under the broader term of tokenism without mention of "solo

status." In the present paper, I am focusing on solo (versus token) status, but, given the conceptual and terminological overlap, I also cite research on tokenism when relevant.

Solo status can occur within a variety of contexts and for a variety of people and thus should not be understood as a chronic state or stigma (Crocker, Major, & Steele, 1998; Goffman, 1963). Kanter (1977a) examined the effects of being a salient minority within an organization, a condition that is becoming increasingly rare as organizations become larger and more diverse (academia being somewhat of an exception; see Fontaine & Greenlee, 1993; Niemann & Dovidio, 1998). The majority of research on solo status examines the effect of bearing solo status within a workgroup (i.e., a group of two or more individuals who must interact cooperatively and adaptively in pursuit of shared, valued objectives; Salas, Cannon-Bowers, & Blickensderfer, 1997, p. 305). This research generally involves laboratory manipulations of the demographic composition of the workgroup (e.g., Hyers & Swim, 1998; Saenz & Lord, 1989; Sekaquaptewa & Thompson, 2002; 2003; Taps & Martin, 1990), although there are some studies that have been conducted in a field setting (e.g., Sackett et al. 1991; Niemann & Dovidio, 1998).

Solo status can also occur within a *selection context*, defined here as the events that occur during and after a selection decision is made (Gilliland, 1993). Bearing solo status makes in a selection context makes one's group membership (e.g., gender) more salient and thus provides an external attribution for any outcomes received (Crocker & Major, 1989; Weiner, Russell, & Lerman, 1979), including that of a selection decision (Gilliland, 1993). Stated differently, bearing solo status in a selection context creates uncertainty about the reason for hire (i.e. gender versus merit). I return to this point later in a separate section when I review the small body of research on solo status within a

selection context (Heilman, 1980; Heilman & Blader, 2001; see also Craig & Feasel, 1998).

The consequences of solo status on the solos themselves have been investigated in both field[1] and lab[2] settings. In a prototypical field study, Niemann and Dovidio (1998) examined how racial/ethnic solo status related to the job satisfaction of 425 White and racial/ethnic-minority members of the American Psychological Association working in psychology departments in academia. Regression analyses suggest that minority faculty members bearing solo minority status within their departments felt less satisfied with their job. Specifically, solo minorities had lower levels of job satisfaction than did non-solo minorities ($\beta = .19$, $t\ (156) = 2.48$, $p < .014$). Moreover, a priori tests revealed the same pattern of significant differences within all ethnic sub-groups (i.e., African Americans, Asians, and Hispanics). Although recognizing the methodological limits of a survey for establishing causality, the authors' results suggest that perceived distinctiveness associated with solo minority status (which I define and discuss in a separate section) mediates the link between solo status and job (dis)satisfaction.

In a prototypical lab study, Lord and Saenz (1985) led 48 male and female undergraduates to believe that they were sharing their views on everyday topics with three other participants (actually videotaped confederates), who were either all of the participants' own sex or all of the opposite sex. Some of the study participants were asked to contribute to the dialogue, while others were asked to observe. The authors'

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[1] e.g., Alexander & Thoits, 1985; Garland & Price, 1977; Hamner, Kim, Baird, & Bigoness, 1974; Heikes, 1991; Kanter, 1977; Niemann & Dovidio, 1998; Ott, 1989; Sackett et al., 1991; Yoder & Aniakudo, 1997; Yoder & Sinnett, 1985

[2] Craig & Rand, 1998; Crocker & McGraw, 1984; Cohen & Swim, 1995; Karakowsky & Siegel, 1999; Lord & Saenz, 1985; Pollak & Niemann, 1998; Saenz & Lord, 1989; Taylor, Fiske, Etcoff, & Ruderman, 1978

(using ANOVA-based analyses) found that solo participants who were asked to contribute (as opposed to observe) had lower performance than non-solos (regardless of sex) – i.e., they remembered fewer of the opinions expressed (both by themselves and by others). In contrast, participants who were asked to act as observers remembered more of what the solo (versus non-solo) participants said. The authors interpreted these results to be a function of solos' perceived need to be more aware of the potential of being evaluated by others.

Consequences

As stated previously, existing research suggests that bearing solo status is a negative experience (e.g., Crocker & McGraw, 1984; Floge & Merrill, 1986; Kanter, 1977a; 1977b; Lord & Saenz, 1985; Niemann & Dovidio, 1998; Sekaquaptewa & Thompson, 2002; c.f., Fuegen & Biernat, 2002).

First, existing research suggests that solo status has a negative effect on solos' cognitions. For example, it has been found to negatively affect male and female solos' learning (Saenz & Lord, 1989), to make racial minority solos feel more representative of their race (Pollak & Niemann, 1998), and to prompt male and females to have increased expectations of being stereotyped (Cohen & Swim, 1995). Second, solo status has a negative effect on solos' affect. For example, solos report lower levels of job satisfaction. This is true for racial minorities (Niemann & Dovidio, 1998) and for women (Kanter, 1977a). Additionally, both male and females solos express discomfort by reporting a greater desire to change the composition of their group and to change to a different group (Cohen & Swim, 1995). Finally, solo status has a negative effect on solos' behavior. For example, female solos exhibit lower levels of performance (relative to male counterparts,

Sackett, et al. 1991; Sekaquaptewa & Thompson, 2003; see also Alexander & Thoits, 1985; Lord & Saenz, 1985). Additionally, there is evidence to suggest that both male and female solos exhibit lower levels of emergent leadership behavior when their gender is incongruent with the perceived gender orientation of the group's task (Karakowsky & Siegel, 1999).

Potential Moderators

There are three constructs that have been proposed as potential moderators of the relationship between solo status and cognitions, affect, and behavior. Here, I describe each construct along with the relevant empirical evidence. Later, I describe the theoretical rationale that may underlie their suggested moderated effect.

The first potential moderator is *social status*, such that the negative effects of solo status are stronger for those with lower social status (i.e., women, racial-ethnic minorities, and those with low socio-economic status, Amott & Matthaei, 1996). The abundance of evidence demonstrating the absence of any negative effect for male solos (e.g., Cohen & Swim, 1995; Sackett et al., 1991; Sekaquaptewa & Thompson, 2002; Yoder, 1991; 1994), even in situations where they are the workplace minority (e.g., Floge & Merrill, 1986; Heikes, 1991; Ott, 1989; c.f., Young & James, 2001) provides partial support for this point. However, it is worth emphasizing that social status arises from the context and is relative to the status of other group members, which may explain why Sekaquaptewa and Thompson (2002) found that white female solos exhibited performance decrements in the presence of the relatively higher-status white males but not in the presence of the relatively lower-African American females.

The second potential moderator is *initial self-confidence*, such that solos status' negative effects are more pronounced for individuals with low (versus high) initial self-confidence for the task. To investigate this possibility, Cohen and Swim (1995) manipulated the solo status (within a work group) and task confidence of participants and found that many of the negative effect of solo status (e.g., preference for a different group) were stronger for women with low (versus high) confidence. Thus, this study suggests that initial self-confidence may moderate the relationship between solo status and cognitions, affect, and behavior.

The third potential moderator is what I will refer to as *evaluative pressure*. That is, it is possible that solo status' negative effects only exist in situations where one is called on to demonstrate his/her ability and skills under the scrutiny of others (Sekaquaptewa & Thompson, 2002, p. 705). To investigate this possibility, Sekaquaptewa and Thompson (2002) conducted two lab studies similar to the one conducted by Lord and Saenz (1985), but with separate learning and testing phases (which represented low and high evaluative pressure, respectively). These two studies collectively suggest that white female solos experience performance decrements in the presence of a group comprised of white males but not in the presence of a group comprised of African American females. Sekaquaptewa and Thompson (2002) interpret their results to suggest "the impact of being different from the rest of the group is greatest when it counts the most:" when one is under evaluative pressure (p. 705). .

To summarize, existing research suggests that the effects of solo status may be ameliorated by high social status, high self-confidence, and low evaluative pressure, and, conversely, exacerbated by low social status, low self-confidence, and high evaluative

pressure. Notably, these three constructs are likely related insofar as women and minorities are more often called upon to demonstrate their skills and abilities under the scrutiny of others due to unfavorable stereotypes about their capabilities, which Sekaquaptewa and Thompson (2002, p. 705) suggest is the case. In this way, theoretical rationale underlying each of these proposed moderators might be drawn from the previously introduced construct of stereotype threat (e.g., Steele & Aronson, 1995). That is, solos with low social status are often the targets of negative stereotypes and thus can find themselves in situations marked by evaluative pressure where they are at risk of confirming these stereotypes (which is exacerbated in situations where they do not feel confident about their own ability to perform). I return to this idea later in the paper.

Potential Mediators

As stated previously, the solo status literature (and, more broadly, the demographic composition literature) is plagued with what Lawrence (1997) called "black box" studies, which do not measure intervening process variables. The need to identify and test mediating mechanisms has been echoed by others (e.g., Riordan, 2000; Sekaquaptewa & Thompson, 2003; Young & James, 2001). To this end, I now review the four potential mediators of the relationship between solo status and cognitions, affect, and behavior that have been identified by existing research.

First, *performance expectancies* – defined as beliefs about how well one can perform in a given situation[3] – have been has been found to mediate the relationship between solo status and behavior for females. Specifically, Sekaquaptewa and Thompson (2003) suggest that female solos have lower performance expectancies (compared to

[3] In the applied psychological literature, perceptions of one's capability to complete a task are referred to as one's *self-efficacy* (see Gist & Mitchell, 1992)

males and to non-solos) and that these lower expectancies translate into lower performance. The authors point out that this idea is not new in that previous research has demonstrated that female solos have lower performance expectancies than their non-solo counterparts (e.g., Stangor, Carr, & Kiang, 1998) and that expectancies predict performance (e.g., Eccles, 1994). However, Sekaquaptewa and Thompson (2003) were the first to test this hypothesis in a mediational model. And, consistent with predictions. the authors found that the effect of solo status on performance was partially mediated by performance expectancies, suggesting that women who were expecting to bear solo status developed lower expectancies about their upcoming performance compared to their male counterparts, and that this led to lower levels of actual performance than that of non-solos (p. 73). The authors point out that the fact that the indirect effect of performance expectancies suggest that it may "therefore be but one of numerous factors that account for the influence of solo status on men and women's performance outcomes" (Sekaquaptewa & Thompson, 2003, p. 73).

The next two potential mediators each represent a concern with how one is perceived by others – i.e., solos' *evaluative concerns* and *stereotypic concerns*. Specifically, Saenz and Lord (1989, p. 698) suggest that solos "spend too much time worrying about being evaluated" and thus suffer cognitive deficits, while Sekaquaptewa and Thompson (2002, p. 705) suggest that solos' "negative stereotypic expectations" – i.e., the expectation that one will be negatively stereotyped by others – play a role in their underperformance. These two constructs, which are different from performance expectancies in that they reflect a concern for what others think (rather than a concern for

one's own ability), have been suggested to mediate the relationship between solo status and cognitions and behavior.

Saenz and Lord (1989; see also Lord & Saenz, 1985; Saenz, 1994) infer the presence of evaluative concerns from solo participants' differential performance in "evaluator" and "evaluatee" conditions. That is, the authors suggest and find support for the idea that, if solos spend too much time worrying about being evaluated, this problem will be alleviated in situations where they are asked to evaluate others. Unfortunately, no examination of solo status (of which I am aware) directly measures evaluative and test for their presence in a mediational model.

Two studies (within the solo status literature[4]) suggest that stereotypic concerns may mediate the relationship between solo status and affect and behavior. First, Cohen and Swim (1995) found that male and female solos expect to be stereotyped to a greater degree than non-solos and that they expressed discomfort such that they report desire to change the composition of the group. However, the authors did not test for stereotypic concerns' mediating presence. Moreover, the authors did not specify the content of the stereotype hypothesized to drive the stereotypic concerns, although it likely involves the idea that one's social identity is considered less competent and/or less valued within a given context. Second, Sekaquaptewa and Thompson (2002), in an examination of the performance outcomes of African American solos, tested for the mediating presence of stereotypic concerns, but the authors measured the construct by assessing the activation of general (as opposed to context specific) racial stereotypes (e.g., African Americans are

[4] There are other examinations of the mediating role of stereotypic concerns in the relationship between solo status and achievement-related outcomes (e.g., Stangor, et al., 1998). However, the authors of these studies place themselves within the stereotype threat (as opposed to the solo status) literature and, accordingly, will be reviewed later in the paper.

lazy). The authors note that assessing stereotype activation is difficult in achievement setting and suggest, "negative stereotypic expectations may play a role, but more sensitive assessments may be required to better investigate this role" (p. 705). I argue that perhaps a more construct valid measure is required – i.e., one that actually assess the stereotypic concerns relevant to the situation rather than the activation of general stereotype. This idea is theoretically consistent with the stereotype threat literature, which, as I will demonstrate later, emphasizes the perceived pressure of stereotype confirmation over the actual activation of the stereotype itself.

Finally, as previously discussed, the results of Niemann and Dovidio (1998) suggest that perceived distinctiveness mediates the role between solo status (within a department) and affect (i.e., job satisfaction). The authors define *perceived distinctiveness* as "the subjective experience of visibility, contrast, and role encapsulation and of being viewed primarily in terms of category membership" and state that the construct "refers to feelings of difference derived from visible differences between people" (p. 55). Niemann and Dovidio (1998) argue that bearing solo status may produce negative consequences for members of traditionally underrepresented and stigmatized groups by increasing feelings of distinctiveness based on group membership, which can "increase the salience of negative stereotypic expectancies (Goffman, 1963; Milliken & Martins, 1996; Steele, 1997; Steele & Aronson, 1995)" (p. 56).

This line of reasoning suggests that "stereotypic expectations" and "perceived distinctiveness" are overlapping constructs. Niemann and Dovidio (1998) themselves point out that the items used to measure perceived distinctiveness represent both "feelings of distinctiveness" and "perceptions of stigmatization and inequitable treatment of

members of minority groups" (p. 67). Respective sample items include "I would feel more comfortable at work if more of my colleagues were members of my ethnic group" and "To be hired for faculty positions in my department, minority candidates must be better qualified than White candidates". The authors even go so far as to say that "although these dimensions are conceptually separable in the laboratory, they may be closely linked in the experience of minorities in more naturalistic settings" (p. 67).

Summary

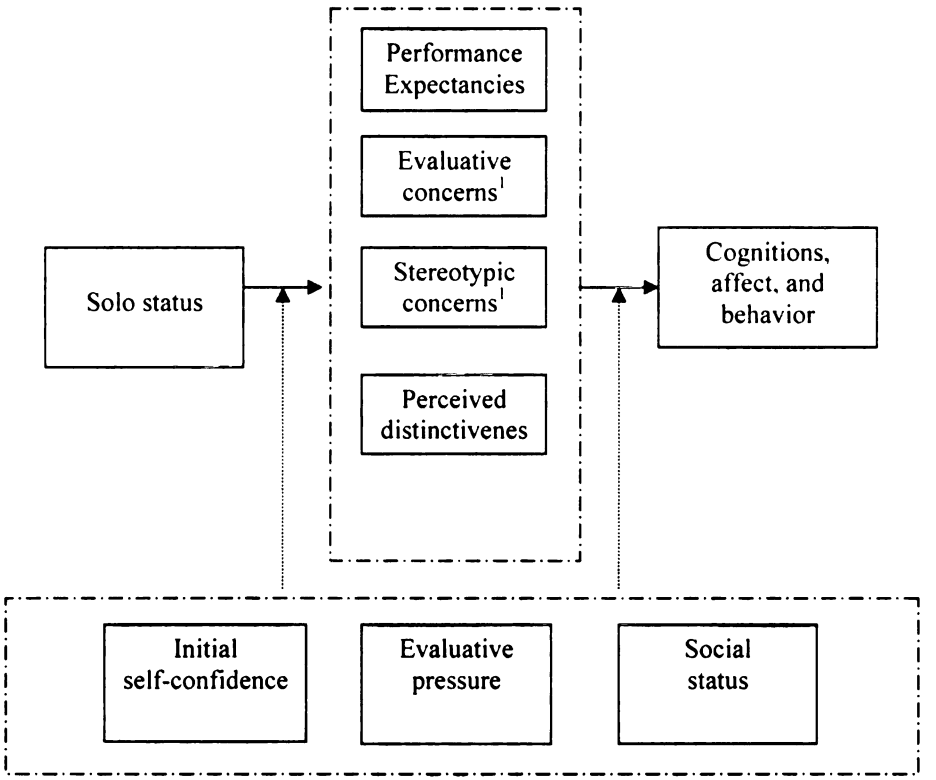
The solo status literature suggests that solo status negatively relates to favorable (i.e., performance-facilitating) cognitions, behavior, and affect. It also suggests some potential moderators and mediators of this relationship. Here, I review these ideas – which have been presented in a fragmented fashion – and suggest how they may be combined to form what I'm terming "The solo status phenomenon from the perspective of the solo status literature" (shown in Figure 1). This framework is admittedly imprecise in it has never been explicitly suggested by any one solo status researcher (including Kanter) but it bears the advantage of efficiently communicating the cumulative findings of the solo status literature to date.

As shown in Figure 1, the solo status literature collectively suggests that solo status' negative effects occur through one or more of the following mechanisms: performance expectancies, evaluative concerns, stereotypic concerns, and perceived distinctiveness. As stated previously, evaluative concerns and stereotypic concerns have not received empirical support in a mediational model (which is footnoted in the Figure 1). Moreover, there has been no discussion of the relationships amongst these four constructs, making it difficult to determine how they may interplay or overlap in any

given context. As stated previously, the exact content of solos' stereotypic concerns likely varies by person and situation. However, I believe that females bearing solo status within a selection context are concerned about the stereotype that they are less competent and less likely to succeed as well as perhaps the idea that, if they are hired, others will think they were preferentially selected on the basis of sex (versus merit). I return to both of these suggestions later in the paper.

The solo status literature has yielded three potential moderators of the relationship between solo status and cognitions, affect, and behavior: social status, initial self-confidence, and evaluative pressure. Two of these three constructs – social status and evaluative pressure – are effectively irrelevant in a traditional selection context such that it is inherently a high evaluative pressure situation and solos are likely to be of lower social status. However, the idea that female solos' initial self-confidence also moderates this relationship (with initially high self-confidence potentially acting to buffer against solo status' negative effects) is relevant across contexts.

Figure 1. The solo status phenomenon from the perspective of the solo status literature.



[1] This construct has not received empirical support in a mediational model.

Stereotype Threat

Claude Steele and his colleagues (Steele, 1997; Steele & Aronson, 1995) recently introduced the construct of stereotype threat, loosely defined as the pressure an individual faces when at risk of confirming a negative, self-relevant group stereotype (Steele & Aronson, 1995). I say "loosely" because there is an absence of consensus as to the exact definition of "stereotype threat" (even within Steele's own work; See Table 1). A precise definition of a construct is critical, facilitating its operationalization and the development of its nomological net and hence future research (Cronbach & Meehl, 1955). Thus, it should be no surprise that there has been a proliferation of research proposing a variety of potential mediators and moderators of the stereotype threat phenomenon with little to no discussion of how they relate to one another (e.g., Steele et al., 2002). However, even with its difficulties, the stereotype threat literature provides several theoretical insights that are directly relevant to the current paper. Thus, further clarification of the construct is necessary.

Stereotypes have been defined in a variety of ways (Greenwald & Banaji, 1995; See Table 2). For the present paper, *stereotypes* are defined as a cognitive structure that contains the perceiver's knowledge, beliefs, and expectancies about some human group (Hamilton & Trolier, 1986, p. 133). Stereotype threat has been characterized as a stereotype pertaining to one's own group (i.e., *self-stereotypes*; Wheeler & Petty, 2001). However, I argue that stereotype threat more accurately refers to a stereotype pertaining to one's own group *that is believed to be held by others* (e.g., Steele & Aronson, 1995) and thus differs from a self-stereotype in that it does necessitate that the target internalize the stereotype (e.g., Crocker, et al., 1998).

Table 1

Sample Definitions of Stereotype Threat

Definition	Article
... being in a situation where one faces judgment based on societal stereotypes about one's group, an experience we refer to as *stereotype threat* (p. 5)	Spencer, Steele, & Quinn (1999)
Stereotype threat occurs when one recognizes that a negative stereotype about a group to which one belongs is applicable to oneself in a particular situation. This is threatening, I argue, because one then realizes that one could be seen or treated in terms of that negative stereotype (p. 680)	Steele (1998)
... the existence of such a stereotype means that anything one does or any of one's features that conform to it make the stereotype more plausible as a self-characterization in the eyes of others, and perhaps even in one's own eyes. We call this predicament *stereotype threat* ... (p. 797)	Steele & Aronson (1995)
When a negative stereotype about a group that one is part of becomes personally relevant, usually as an interpretation of one's behavior or an experience one is having, *stereotype threat* is the resulting sense that one can be judged or treated in terms of the stereotype or that one might do something that would inadvertently confirm (p. 389)	Steele, Spencer, & Aronson (2002)

Table 2

Sample Definitions of a Stereotype (from Greenwald & Banaji, 1995)

Definition	Article
A stereotype is an exaggerated belief associated with a category (p. 191)	Allport (1954)
A set of beliefs about the personal attributes of a group of people (p. 16)	Ashmore & Del Boca (1981)
An ethnic stereotype is a generalization made about an ethnic group, concerning a trait attribution, which is considered to be unjustified by an observer (p. 13)	Brigham (1971)
A cognitive structure that contains the perceiver's knowledge, beliefs, and expectancies about some human group (p. 133)	Hamilton & Trolier (1986)
A stereotype is a fixed impression, which conforms very little to the fact it pretends to represent, and results from our defining first and observing second (p. 181)	Katz & Braly (1935)
A categorical response, i.e., membership is sufficient to evoke the judgment that the stimulus person possesses all the attributes belonging to that category (p. 309)	Secord (1959)

Accordingly, to distinguish between the stereotypes that one holds about one's self and the stereotypes that one believes that others hold about one's self. I will refer to the latter with the recently proposed construct of meta-stereotypes. *Meta-stereotypes* are an extension of the literature on *meta-perceptions* (defined as beliefs about another's impressions of one's self; e.g., Kenny & DePaulo, 1993; Vorauer & Claude, 1998; Vorauer & Miller, 1997) and refer to one's beliefs regarding the stereotype that others hold about one's own group (Vorauer, Main, & O'Connell, 1998). Thus, the content of meta-stereotypes reflect the assumptions that people hold about the stereotypes others have about the social group(s) to which they belong. Vorauer, Hunter, Main, and Roy (2000) empirically examined meta-stereotypes in the context of social interaction and found that the potential for evaluation by (as opposed to mere exposure to) another in a valued domain[5] is a precondition for meta-stereotype activation. This point is an important one, as it suggests that "stereotype threat" and "the activation of an unfavorable meta-stereotype" are tapping a similar phenomenon.

A conventional definition of *stereotype threat* is "the realization that one's performance on a particular task might confirm a negative stereotype about ones' group" (Bosson, Haymovitz, & Pinel, 2003, p. 247; Steele & Aronson, 1995). However, because the potential for (in this case, unfavorable) evaluation by someone else in a valued domain is a precondition for meta-stereotype activation (Vorauer, et al., 2000), I argue that a more precise and parsimonious definition of the construct is "the activation of an unfavorable meta-stereotype." The problem with this definition is that it is not well-supported by the existing stereotype threat literature, which focuses on self- (vs. meta-)

[5] Readers familiar with the stereotype threat literature might wonder how this relates to *domain identification*, a point I return to later

stereotypes. Given that the purpose of this paper is not to develop new constructs (or new labels for existing constructs), I will use the aforementioned, existing definition to guide further discussion.

Necessary conditions for stereotype threat to occur are that a negative stereotype must exist (Steele, 1997), the target must be aware of the stereotype, and the target must believe that the relevant entity (i.e., the one making the evaluation) is aware of the stereotype.

The Present Review: A Cautionary Note

While the present paper focuses on females applying for jobs that have historically been occupied by males, Steele and Aronson's (1995) seminal research focused on African Americans taking cognitively loaded measures of knowledge, skills, and abilities. Such measures are among the most valid predictors of performance but bear the undesirable consequence of yielding racial sub-group differences (with an average majority-minority difference of .83 standard deviations; Schmitt, Clause, & Pulakos, 1996). These sub-group differences are meaningful because scores on such tests are frequently the basis for high-stakes decisions in a variety of contexts (e.g., employment, academic admission, licensure, and certification; see Sackett, Schmitt, Ellingson, & Kabin, 2001). Thus, Steele and Aronson's (1995) finding that the African American–White difference in standardized test performance was larger when participants were in the stereotype threat condition than when they were in the non-threat condition is an important one, as it suggests that "the instructional set under which examinees approach a test can affect test results" (Sackett, Schmitt, Ellingson, & Kabin, 2001, p. 310).

Unfortunately, many mainstream news stories (e.g., the Public Broadcast Service [PBS] show *Frontline*; Chandler, 1999) and introductory psychology textbooks have erroneously interpreted Steele and Aronson's (1995) research to mean that eliminating stereotype threat will eliminate the African American–White difference in standardized test performance (see Sackett et al., 2001; Sackett, 2003; Sackett, Hardison, & Cullen, 2004). The source of the misunderstanding is Steele and Aronson's (1995) decision to statistically control for differences in students' prior standardized test performance. Therefore, the practical implications drawn from the Steele and Aronson (1995) data have been called into question. Specifically, although there was some observed stereotype threat effect on performance over-and-above than that predicted by standardized cognitive ability, reducing the threat effect and ignoring ability will have no impact on test performance. Since racial difference on cognitive tests is a well-established finding and since ability tests predict the kinds of performance that Steele and Aronson (1995) used in their study, one cannot infer that removing the treat will remove difference in performance between the groups.

Although Sackett and his colleagues (Sackett, 2003; Sackett et al., 2001; 2004) call into question implications drawn from the stereotype threat literature for reducing race differences in performance, they do not invalidate the relevance of the stereotype threat literature for issues regarding stereotype threat based on gender. This is because on the kinds of jobs or tasks relevant to the present study there is no a priori reason to expect ability differences between men and women. Or, put another way, a priori differences for which Steele and Aronson (1995) controlled through statistical means are assumed not to exist. Whether they do or do not is an empirical question in any one study and can be

investigated, but there is no reason to expect that difference. Assuming no difference occurs, then the fact that Steele and Aronson observe a stereotype threat effect with equated racial groups means that one too should expect an effect in gender groups with equal ability.

Antecedents

What prompts one to experience stereotype threat? Unfortunately, there is not a "definitive set of such cues" (Steele et al., 2002, p. 419) and thus researchers have manipulated the construct in a variety of ways (see Table 3). The focus of the present paper is solo status, and there is laboratory and field evidence to suggest that bearing solo status can prompt one to experience stereotype threat. Stangor et al. (1998) prompted stereotype threat for female (but not male) participants in a laboratory study by manipulating anticipated solo status. Unfortunately, the authors did not directly measure stereotype threat, but rather inferred its presence from its "effects" (e.g. decreased performance expectancies). The content of the threatening stereotype was that the spatial-abilities task (that they were about to perform) was one in which men were known to perform better than women. That is, the stereotype suggested that females were considered less competent and less likely to succeed (relative to males).

More recently, Roberson and her colleagues (2003) examined African American professionals and found a significant correlation ($r=.16$, $p<.05$) between bearing solo status within their department and reported experience of stereotype threat, as measured with items such as "Other people expect me to perform poorly because of my race." Thus, the content of the threatening stereotype concerns the idea that African Americans are less capable of performing the job (than Whites).

Table 3

Sample Operationalizations of Stereotype Threat

Operationalization	Study
Asked participants to indicate race	Steele & Aronson (1995, Study 4)
Presented inherently threatening subject matter	Osborne (2001), Schmader, (2002), Quinn & Spencer (2001)
Made participants aware of unfavorable stereotype	Aronson, et al. (1999), Leyens, Desert, Croizet, & Darcis (2000)
Placed participants in situation where they bore solo status	Carr, Stangor, & Kiang, (1998), Inzlicht & Ben-Zeev (2000)
Told participants that members of their group usually performed worse on this task	Carr, et al. (1998, Study 1), O'Brien & Crandall (2003), Spencer, Steele, & Quinn, 1999
Told participants that task was diagnostic of their ability	Gonzales, Blanton, & Williams (2002), McKay, Doverspike, Bowen-Hilton, & Martin (2002), Steele & Aronson (1995, Studies 1, 2, & 3)
Used male (vs. female or neutral) character in math problem	Walsh, Hickey, & Duffy (1999, Study 1)
Exposed participants to stereotypic commercials	Davies, Spencer, Quinn, & Gerhardstein (2002)
Measured participants' perceived stereotype threat	Roberson, Deitch, Brief, & Block (2003), Steele & Aronson, (1995, Study 4)

For female solos applying for a traditionally masculine job (e.g., managerial and professional positions, Arnott & Matthaei, 1996; Burke, 1996; Federal Glass Ceiling Commission, 1995; Powell, Butterfield, & Parent, 2002), I believe the relevant meta-stereotype relates to their comparatively lower levels of competence and likelihood of success in the workplace (versus men). While there is no study within the stereotype threat literature that addresses stereotypic conceptions of women in the workplace, those that address stereotypic conceptions of women in academic settings (e.g., Ambady, Paik, J. Steele, Owen-Smith, & Mitchell, 2003; Brown & Pinel, 2003; Ford, Ferguson, Brooks, & Hagadone, 2004; Inzlicht & Ben-Zeev, 2000; McIntyre, Paulson, & Lord, 2003; Pronin, Steele, & Ross, 2003; Quinn & Spencer, 2001; Spencer, Steele, & Quinn, 1999; Walsh, Hickey, & Duffy, 1999) follow the theme suggested here.

A considerable amount of evidence in other literatures supports the existence of unfavorable stereotypes about women in the workplace (e.g., Crocker et al., 1998; Deaux & LaFrance, 1998; Dipboye, 1985; Fiske, 1998; Heilman, 1983; 2001; Martell, Parker, Emrich, & Crawford, 1998; Murrell & James, 2001). Specifically, existing research suggests that women are stereotypically considered less competent and less likely to succeed in traditionally masculine jobs (see Dipboye, 1985; Heilman, 1983; Heilman & Haynes, in press), that they can become aware of this stereotype and its potential role in others' evaluation of them (Heilman & Alcott, 2001), and that this awareness can ironically interfere with their performance. This interference may occur either via others reactions' towards them (e.g., Heilman, Wallen, Fuchs, & Tampkins, in press) or via something akin to Merton's (1948) notion of a self-fulfilling prophecy (e.g., Heilman & Alcott, 2001).

Consequences

Although stereotype threat is hypothesized to be relevant for a variety of outcomes, most of the existing research has examined the effects of stereotype threat on standardized test performance (Steele et al, 2002, p. 391). Thus, the basic finding within the stereotype threat literature (based on research-to-date) is that experiencing stereotype threat negatively relates to standardized test performance. More specifically, current research suggests that those for whom unfavorable meta-stereotypes about performance have been activated (e.g., by bearing solo status) display lower test performance than those for whom such a meta-stereotype has not been activated or does not exist. And, as stated previously, Steele and Davies (2003) state that this effect "has been shown in multiple groups, on many tests, in laboratory and real-life testing situations, in many countries, by many different investigators, in published experiments that now approach 100 in number" (p. 312).

Earlier, I identified two studies that establish a link between solo status and stereotype threat (Roberson et al., 2003; Stangor et al., 1998). Here, I discuss what these studies found to be the consequences of stereotype threat. In addition to prompting individuals to experience stereotype threat by manipulating anticipated solo status, Stangor, et al. (1998) manipulated the expectations of success of participants and found that participants who were given reason to have high expectations of success (via feedback) reported higher performance expectancies, but only in the non-threat (i.e., non-solo) conditions. This finding led the authors to conclude that stereotype threat (occurring as a result of anticipated solo status) negatively impacts performance expectancies and that these expectations are strong enough to overwhelm high expectations of success.

Roberson et al. (2003) examined the relationship threat between stereotype threat (occurring as a result of bearing solo status) and various feedback-seeking behaviors of African American professionals – namely, feedback seeking, feedback monitoring, and feedback acceptance. The authors found that the experience of stereotype threat was associated with increased use of a monitoring strategy for seeking feedback and a greater degree of feedback discounting (i.e., dismissing feedback and/or viewing it as irrelevant). The authors also note that feedback monitoring (vs. feedback seeking) is less useful than direct inquiry for performance improvements and, coupled with discounting, may "indicate pathways through which job performance is negatively affected" (p. 186). Additionally, Roberson et al. suggest that these findings are consistent with those of the solo status literature, which suggest that that solos are likely to have increased evaluative concerns (e.g., Saenz, 1994).

There have also been two interesting hybrid studies that examined the dual-effects of solo status and stereotype threat manipulations. Inzlicht and Ben-Zeev (2000, Study 1) asked female undergraduates to take either a multiple-choice test comprised of either math (i.e., threatening) or verbal (i.e., non-threatening) items from the Graduate Record Exam (GRE) along with two other participants (actually confederates), who were either of the participants' own sex or of the opposite sex. Participants were informed that their performance would be orally shared with the other participants. Thus, the experiment used a 2 (solo/non-solo status) x 2 (stereotype threat/no threat condition) between subjects design. The key dependent variable was test performance. The authors also conducted a second study (Inzlicht & Ben-Zeev, 2000, Study 2), which was identical except that (a) they manipulated the solo status of both male and female participants and

(b) they only used the math (and not the verbal) test. The results of the two studies suggest that solo females experience performance deficits only on the math (but not the verbal) test, whereas males perform equally well on the math test regardless of solo status. Further investigation showed that females' deficits are proportional to the number of males in their group (i.e., solo females performed worse on the math test than non-solo females).

In another hybrid study, Sekaquaptewa and Thompson (2003) used a procedure similar to the one employed by Lord and Saenz (1985; see above) where they led male and female undergraduates to believe that they were discussing information with three other participants (actually videotaped confederates), who were either all of the participants' own sex or all of the opposite sex. Math information was presented in either a threatening or non-threatening way, using different presentation methods (i.e., numbers vs. terminology) and variable stereotype applicability (e.g., "Although gender differences in test performance have been reported using traditional math materials, previous testing has shown that men and women perform equally well on this type of material"; See Spencer et al, 1999). Thus, the experiment used a 2 (solo/non-solo status) x 2 (stereotype threat/no threat condition) x 2 (participant gender) between subjects design. The key dependent variable was performance (i.e., participants' answers to oral exam questions). The authors found that "Both solo status and [the] stereotype threat [manipulation] negatively influenced the performance of women but not men" and that "these factors had an additive effect on women's performance: performance was lowest when both factors were present and highest when both factors were absent" (Sekaquaptewa & Thompson, 2003, pp. 72-73).

To summarize, stereotype threat (occurring as a result of bearing solo status) has been shown – at least in laboratory settings – to negatively affect females' performance expectancies and to increase African Americans' feedback monitoring and feedback discounting. Additionally, stereotype threat (occurring as a result of other manipulations) and solo status have been shown to have an additive and negative effect on females' performance.

Potential Moderators

Steele and his colleagues (2002) review what they call the "most documented moderators" of the relationship between stereotype threat and standardized test performance: three situational factors (*task difficulty, test diagnosticity*, and *stereotype relevance*) and three individual difference factors (*domain identification, group identification*, and *stigma consciousness*) (p. 391). Definitions of each of these constructs (as well as sample operationalizations) are provided in Table 4. Additional, more recently examined individual difference variables include testosterone levels (Josephs, Newman, Brown, & Beer, 2003) and coping sense of humor (Ford, Ferguson, Brooks, & Hagadone, 2004).

The situational factors are theoretically irrelevant to the present paper in that they are assumed present in a selection context (i.e., as the events that occur during and after a selection decision is made; Gilliland, 1993). That is, the presence of a testing situation implies that the relevant task is both difficult and perceived to be sensitive enough to yield evaluative information and thus one that evokes stereotype threat (see Sackett, 2003; Steele & Davies, 2003).

Table 4

Potential Moderators of the Effect of Stereotype Threat on Test Performance (from Steele et al., pp. 391-392, 394-397)

Environmental Features
Task Difficulty: The degree to which the task is cognitively challenging (e.g., Spencer et al., 1999, administered the math section of the general GRE and the GRE subject test in mathematics)
Test Diagnosticity: The degree to which the task is presented as capable of discriminating across ability levels (e.g., Steele & Aronson, 1995, either told participants that the test they were about to take was 'diagnostic' or 'non-diagnostic' of ability)
Stereotype Relevance: The degree to which a negative stereotype about a group's ability is made relevant to the performance at hand (e.g., Aronson et al., 1999, told white male participants that Asians are stereotyped to excel at math)
Individual Differences
Domain Identification: The degree to which performance holds importance for one's self-worth (e.g., Stone, et al., 1998, measured the extent to which individuals' perceived self-worth was contingent on their athletic ability)
Group Identification: The degree to which one identifies with the social group to which the negative stereotype is directed (e.g., Schmader, 2002, measured the extent to which females' gender was important to their identity)
Stigma Consciousness: The degree to which one expects to be stereotyped by others (Pinel, 1999)

Existing research on individual difference variables suggests that one is more likely to experience stereotype threat when he or she defines himself or herself in terms of the task (Pronin et al., 2003), is conscious of the relevant stigma (Brown & Pinel, 2003), identifies with the group (Schmader, 20002), and has high testosterone levels (Josephs et al., 2003). Conversely, one is less likely to experience stereotype threat when she has a coping sense of humor (Ford et al., 2001). While each of these findings highlight potentially fruitful areas of future research, they were published after the hypothesis development phase of the present paper and thus will not be discussed further.

Potential Mediators

What are the mechanisms through which stereotype threat affects performance (and related cognitions, affect, and behavior)? This remains an open question. Although there has been some discussion of primary appraisal mediators (i.e., cognitions about the threat itself), most research-to-date focuses on secondary appraisal mediators (i.e., cognitions about ability to cope with the threat). In fact, there is only published study within the stereotype threat literature that assesses a primary appraisal variable (i.e., stereotype activation, Steele & Aronson, 1995, Study 3) and this study did not measure its resulting effect (e.g., on performance), leaving it unclear whether or not it plays a mediating role.

Two secondary appraisal mediators have received published empirical attention: *performance expectancies* (Spencer, et al., 1999; Cadinu, Maass, Frigerio, Impagliazzo, & Latinotti, 2003) and *evaluative concerns* (i.e., evaluation apprehension, anxiety; Leyens, Désert, Croizet, & Darcis, 2000; Osborne, 2001; Spencer et al., 1999). There is some support for the idea that performance expectancies mediate the relationship

between stereotype threat and test performance. Spencer et al. (1999) measured female participants' performance expectancies, but "nothing happened" (Steele et al, 2002, p. 399). That is, the stereotype threat manipulation did not affect females' performance expectancies, and their performance expectancies did not relate to their actual performance. However, more recently, Cadinu et al. (2003) found some support for the mediating presence of performance expectancies. In Experiment 1, the authors found that performance expectancies partially mediated the relationship between stereotype threat and the math performance of female students for whom math was important. In Experiment 2, they found performance expectancies partially mediated the relationship between stereotype threat and the verbal performance of African Americans living in Italy. However, these results have a little twist such that the mediating effect was only present for participants for whom the minority category membership (Black) was made salient and not for those for whom the majority category membership (American) was made salient. In the words of the authors, the reason for this specific finding is "not clear" (p. 283) but they suggest "caution is needed when extending a general stereotype threat model to high status group memberships" (p. 284).

There is some support for the suggestion that evaluative concerns act to mediate the relationship between stereotype threat and test performance. The two laboratory investigations yielded null results. Specifically, Spencer et al. (1999) found that stereotype threat had a negative on participants' self-reported anxiety levels and on their performance, but analyses did not reveal that anxiety played a mediating role. And Leyens et al. (2000) found no evidence to suggest that anxiety played a mediating role in the relationship between stereotype threat and males' performance on an affective

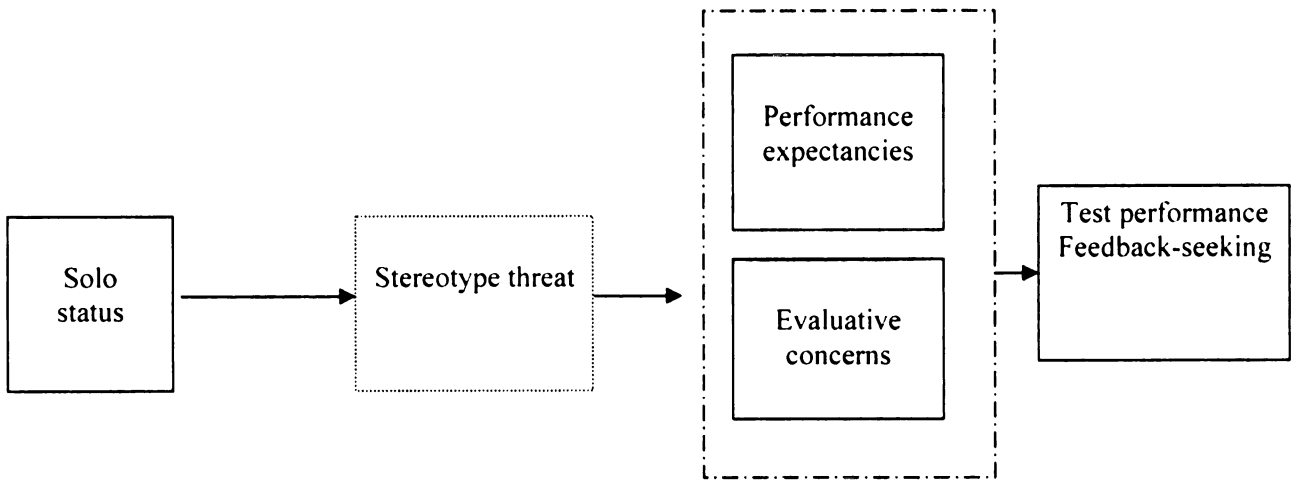
processing test. However, Osborne (2001), in a field study, found that anxiety partially mediated the relationship between stereotype threat (which was presumed present as a function of test content) and African Americans' academic performance and women's math performance.

Steele et al. (2002) conclude their review and critique of this body of research with what they admit is "not a fully satisfying resolution," which is that, "depending on the sensitivity of measures used, different multiples of these [mediating] processes will be found to mediate different occurrences of this threat in the laboratory. And in real life, multiple and varied mediation of this threat will almost certainly be the rule, not the exception" (pp. 406-407). So, as stated previously, the mechanisms through which stereotype threat affects test performance remain unspecified. However, it seems that performance expectancies and evaluative concerns may play a role.

Summary

Here, I describe the solo status phenomenon from the perspective of the stereotype threat literature (represented in Figure 2). As before, Steele and his colleagues have not advanced this framework, but it represents how their theory and research may apply to the present paper.

Figure 2. The solo status phenomenon from the perspective of the stereotype threat literature.



First, the stereotype threat literature suggests that bearing solo status prompts solos to experience stereotype threat. Specifically, for females applying for positions historically occupied by men, bearing solo status within their applicant pool activates an unfavorable meta-stereotype, the content of which likely suggests that they are less competent and less likely to succeed in traditionally masculine jobs. Second, this literature suggests that stereotype threat (occurring as a result of bearing solo status) has negative consequences for the perceiver (e.g., lower performance). Finally although this literature has yet to specify the exact mechanisms through which these negative consequences occur, it provides tentative support for the idea that solos' performance expectancies and evaluative concerns may each play a role.

Solo Status within a Selection Context

As stated previously, there is no published examination of the effects of bearing solo status within a selection context on the solos themselves. Stated differently, there is no published examination of the effects of bearing solo status within an applicant pool *or* within a newly hired cohort *on the solos themselves*. And, more specifically, there is no published examination of the effects of bearing solo status within an applicant pool on the cognitions, affect, and/or behavior of newly hired females. Thus, to develop hypotheses for the present paper, I draw from the three studies conducted by Heilman and her colleagues (Heilman, 1980; Heilman & Alcott, 2001; Heilman & Blader, 2001) that I argue collectively speak to this issue. It is important to note that only one of the three studies includes a manipulation of the solo status of individuals within an applicant pool (Heilman, 1980) and none of them examines the effect of bearing solo status within an applicant pool on the solos themselves. Thus, it is necessary to explain how these studies relate to the present paper.

The first study I review (Heilman, 1980) manipulates solo status within an applicant pool and then examines the effects on others' personnel decisions. The results of this study suggest that solo status activates detrimental sex stereotypes in the minds of others, which I will use to argue that bearing solo status actives similar meta-stereotypes in the minds of the solos themselves.

The second study (Heilman & Blader, 2001) manipulates solo status within a newly hired cohort and then examines the effects on others' perceptions of the solos (with respect to reason for hire and level of competence). Thus, there are two features of Heilman and Blader's (2001) research that are different from the present study. The first is an issue of context. The authors' focus is on bearing solo status within a cohort of newly hired individuals, while the present focus is on bearing solo status within an applicant pool (and then being hired for the job). As stated previously, some may argue that the "why" of solo status in these two contexts is different such that solo status within a newly hired cohort may be attributed to someone's purposeful decision, while solo status within an applicant pool may be attributed to chance. However, as stated previously, the situations are similar once the solo applicant has been hired in that bearing solo status in both contexts creates ambiguity about the reason for hire. Thus, I am arguing that it makes sense to draw from Heilman and Blader's (2001) work in developing hypotheses for the present paper.

The second feature of Heilman and Blader's (2001) research that is different from the present study in that the authors focus on the others' reaction to the solo, while the present study focuses on the reactions of the solos themselves. However, as I will argue later, Heilman and Blader's (2001) results – which suggest that solo status actives the

perception of preferential selection in the minds of others – are relevant to the present paper in that they lend support to the idea that solo status activates a similar meta-perception in the minds of the solos themselves.

The third study I review (Heilman & Alcott, 2001) does not involve solo status at all but rather manipulates women's beliefs about whether or not others view them as preferentially selected. Later, after reviewing the results of Heilman and Blader (2001), I explain the relevance of Heilman and Alcott's (2001) findings to the present study in more detail. For now, I will simply point out that these findings connect to the present research in that they focus on what I see as a consequence of bearing solo status within an applicant pool for the solos themselves (the meta-perception of preferential selection).

In sum, none of the three studies reviewed here individually speaks to the effect of bearing solo status within an applicant pool on the solos themselves. Rather, the results of Heilman and Blader (2001; see also Heilman, 1980) suggest that women bearing solo status within an applicant pool are subject to the assumption that they are less competent and are beneficiaries of preferential selection, and the results of Heilman and Alcott (2001) suggest that women who have been made aware that others view them as beneficiaries infer decreased competence expectations and are vulnerable to lower performance (relative to those not made aware that others view them as beneficiaries; Heilman & Alcott, 2001). Later, I consider this pattern of findings in conjunction with the solo status and stereotype threat literatures (which have examined the effects of bearing solo status on the solos themselves, but not in a selection context), and, based on this, suggest an implied but not yet untested model of the relationship between bearing

solo status within an applicant pool on newly hired females' cognitions, affect, and behavior.

Heilman (1980)

Heilman (1980) assessed the extent to which the sex composition of an applicant pool influences others' personnel selection decisions. She suggests, "increased proportional representation of women in the applicant pool [minimizes] the use of detrimental sex stereotypes and consequently [reduces] discriminatory selection decisions" (p. 388). To guide further discussion, I present this idea as two implied hypotheses: Solo (or minority) status prompts others to make unfair (unfavorable) selection decisions, and this relationship is mediated by the use of the stereotype that women are less capable of performing the job (e.g., because they are less ambitious and more irrational) and thus less likely to succeed.

To empirically test these implied hypotheses, Heilman (1980) asked masters of business administration students (half male and half female) to evaluate an individual's employment application. Specifically, she asked participants to assess the applicant's qualifications and potential as well as to provide a hiring recommendation. Heilman (1980) assessed the use of sex stereotypes by asking participants to rate to applicants along four adjective dimensions found to be associated with different widely shared perceptions of male and female work orientations (e.g., Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972). They were: ambitious-unambitious; emotional-rational; decisive-indecisive; and tough-soft.

The position for which the applicant was applying was "traditionally masculine:" a managerial position in a large insurance company (Heilman, 1980, p. 393). Participants

were also given information about seven other individuals in the applicant pool (to use as points of comparison) and led to believe that zero, one, two, three, or all of these other applicants were female. Thus, the design was a 2 x 5 factorial, with the independent variables being Subject Sex and Sex Composition of the Applicant Pool.

The first hypothesis was supported. Solo female applicants were judged less favorably their non-solo counterparts. The second hypothesis also received at least partial support. Namely, although Heilman (1980) states, "the idea that [stereotypic] impressions mediate selection evaluations was supported by our findings" (p. 393), I contend that the second hypothesis was only partially supported because no mediational analyses were conducted. Rather, covariance analyses using the composite adjective score as a covariate were conducted on each of the three selection decision variables. Results indicated that when the adjective score was factored out, no effects involving the Sex Composition variable were found to be significant. Thus, while these results are consistent with the idea that stereotype use mediates the relationship between solo status and selection decisions, these analyses do not explicitly test mediation.

In short, Heilman (1980) demonstrates that bearing solo status within an applicant pool (for a traditionally masculine job) negatively affects selection decisions and suggests that this relationship might be mediated by the use of stereotypes, such that solo status makes sex more salient and in turn makes male and female evaluators more likely to use detrimental sex stereotypes.

Heilman and Blader (2001)

Heilman and Blader (2001) assessed co-workers' reactions to females bearing solo status in a cohort of newly hired individuals. The authors hypothesized that being

exposed to a solo female in an otherwise male cohort would prompt co-workers to perceive the solo as preferentially selected – i.e., hired (at least in part) on the basis of her sex (versus her merit). The authors further hypothesized that this effect would not occur for non-solo females or for males (whether they were solo or non-solo).

Although Heilman and Blader (2001) did not set out to empirically examine the mechanisms underlying the proposed effect (i.e., that being exposed to a solo female in an otherwise male cohort of new hires would prompt co-workers to perceive the solo as preferentially selected), their basic reasoning is that seeing something "out of the ordinary" prompts a need for explanation that is most easily fulfilled by assuming that the solo was preferentially selected. More specifically, the authors claim that assuming that one was preferentially selected "requires far less cognitive exertion than modifying group stereotypes or devising new subgroup categories to account for the unexpected occurrence" (p. 181). Moreover, the authors state that this assumption is "cognitively efficient and, as a consequence, it predominates (Fiske & Taylor, 1991, pp. 13, 380–381)." In this way, Heilman and Blader (2001) hint at the possibility that the assumption of preferential selection somehow involves a stereotype, a point I will return to later.

To test the link between solo status (within a newly hired cohort) and co-workers' perceived reason for hire, Heilman and Blader (2001) asked laboratory participants to evaluate a fictional cohort of individuals recently accepted to a gender-neutral graduate school program (also fictional and called "Urban Health Studies"). The research design was a 3 × 3 factorial, with the independent variables being the Stated Admissions Policy (preferential selection, merit-based, or ambiguous) and the target admittee's Proportional Gender Representation among the total group of admittees for that year (solo woman,

non-solo woman, or solo man). The authors measured co-workers perceived reason for hire by asking participants to rate the role they thought several different factors played in the decision to admit the target student (played a large role/played no role at all), one of which was the applicant's gender. Heilman and Blader (2001) also measured participants' perceptions of the solos' qualifications as well as their expectations of the solos' future success in the program.

As hypothesized, Heilman and Blader (2001) found that participants who were given no explicit information about the selection process (i.e., those in the "ambiguous" condition) perceived the solo females to be preferentially selected. Further, they found that participants rated solo females as less qualified and less likely to succeed (compared to males and non-solo females). These results are consistent with those of Craig and Feasel (1998), who found that participants were more likely to perceive females (vs. males) bearing solo status within a workgroup as selected for membership on the basis of their sex (vs. ability). Thus, these studies jointly suggest that, in the absence of information to the contrary, co-workers presented with newly hired female solos assume that they were preferentially selected.

Heilman and Alcott (2001)

Heilman and Alcott's (2001) study is somewhat tangential in that it is not an examination of solo status. However, it is related to the previously reviewed study (Heilman & Blader, 2001) – which demonstrates that co-workers assume that newly hired female solos were preferentially selected – in that it examines how knowledge of this assumption affects females' task difficulty choice. Heilman and Alcott (2001) manipulate participants' knowledge of others' assumption about their reason for hire (i.e., merit or

sex). In the interest of presentational simplicity, I will refer to one's belief that others perceive them as selected (at least in part) on the basis of their sex as a *meta-perception of sex-based preferential selection.* As before, this meta-perception is just a perception and is not necessarily accurate.

Heilman and Alcott (2001) suggest that, for females with initially low self-confidence to perform the relevant task, the awareness that others perceive them as preferentially selected prompts them to assume that others perceive them as less competent, which in turn makes them feel less competent, select less difficult tasks, and have less positive affect when performing the task. This perspective implies the following three key points

First, the authors hypothesize that, for females, the meta-perception of preferential selection negatively relates to *inferred competence expectations* (i.e., one's perception of how capable he/she is perceived to be by others). Second, they suggest that, for females, the meta-perception of preferential selection and *information about task ability* (i.e., whether one has been given positive feedback, negative feedback, or no feedback about their ability to perform the task) have an interactive effect on *task difficulty choice* and the favorability of one's *affective reactions.* More specifically, they suggest that, in the absence of favorable information about one's task ability, females' meta-perception of preferential selection will negatively relate to task difficulty choice and to positive affect (e.g., enjoying the task). Finally, the authors suggest that are at least two possible mediating mechanisms. They suggest that *self-efficacy*[6] (i.e., belief about one's capability to perform; Gist & Mitchell, 1992) acts as a mediator for individuals not provided with information about their ability and that a construct called *motivational forces* (which they

[6] Note that the authors use "information about task ability" and "self-efficacy" interchangeably.

do not define) acts a mediator for individuals provided with favorable information about their ability. They also cite the stereotype threat literature and hint at the possibility that "stigma awareness" and/or "stereotypes" may somehow play a role. Thus, similar to Heilman and Blader (2001), Heilman and Alcott (2001) do not make any stereotype-based hypotheses but imply that stereotypes are somehow relevant. However, in the present case, the focus is on participants' meta-stereotypes (i.e., perception of others' stereotypic views of them), while, previously (Heilman, 1980; Heilman & Blader, 2001), the focus was others' other-stereotypes about the participants (which were solos). The role of solos' meta-stereotypes is worthy of further consideration, and is addressed it in more detail later in the paper.

To empirically test these ideas, Heilman and Alcott (2001) conducted two studies where they partnered female participants with male confederates to perform a task that they were told was one at which men traditionally perform better. Study 1 was a 2 x 3 factorial design and Study 2 was a 2 x 2 factorial design. The authors manipulated the same two independent variables for both studies – Implied Selection Method (merit or preferential selection based on gender) and Information About Task Ability Level (high, low, or not provided) – but in Study 2, the authors omitted the "low ability" condition. The dependent measures were inferred competence expectations, task difficulty choice, self-view of competence, and favorability of affective reactions.

The favorability of participants' affective reactions while performing the task were assessed with a general measure that Heilman and Alcott (2001) created. The authors averaged self-reports of favorability of affect while working on the task (e.g., *happy – not happy, not annoyed – annoyed*), favorability of descriptions of the task on

affective dimensions (e.g., *pleasant - unpleasant*), and favorability of feelings about the research session (e.g., *very favorable - not at all favorable*). All ratings were made using 9-point response scales.

The results of both studies provide support for Heilman and Alcott's (2001) perspective. First, they found that females' meta-perception of preferential selection negatively related to inferred competence expectations (regardless of information about ability). Second, the results of Study 2 suggested that the relationship between females' meta-perception of preferential selection and task difficulty choice was moderated by information about task ability such that the two were positively related for those given favorable ability information and negatively related for those given no ability information. Third, intercell contrasts indicated that participants experienced less favorable affect when the implied selection method was gender- (vs. merit-) based.

Finally, the results provide tentative support for the suggestion that, at least for females with no information about their ability, the relationship between the meta-perception of preferential selection and task difficulty choice was mediated by some sort of self-perceived ability construct (self-efficacy and/or self-perceptions of competence). Specifically, Heilman and Alcott (2001) conducted covariance analyses (similar to those conducted by Heilman, 1980) and found results that were supportive of the mediating role of self-perceptions of competence, but the authors did not conduct a full-scale mediational analysis. The authors did not empirically test for the mediating presence of "motivational forces." Thus, in sum, Heilman and Alcott's (2001) results suggest the relationship between females' meta-perception of preferential selection and task

difficulty choice is mediated by and depends on constructs that reflect one's initial feelings of capability.

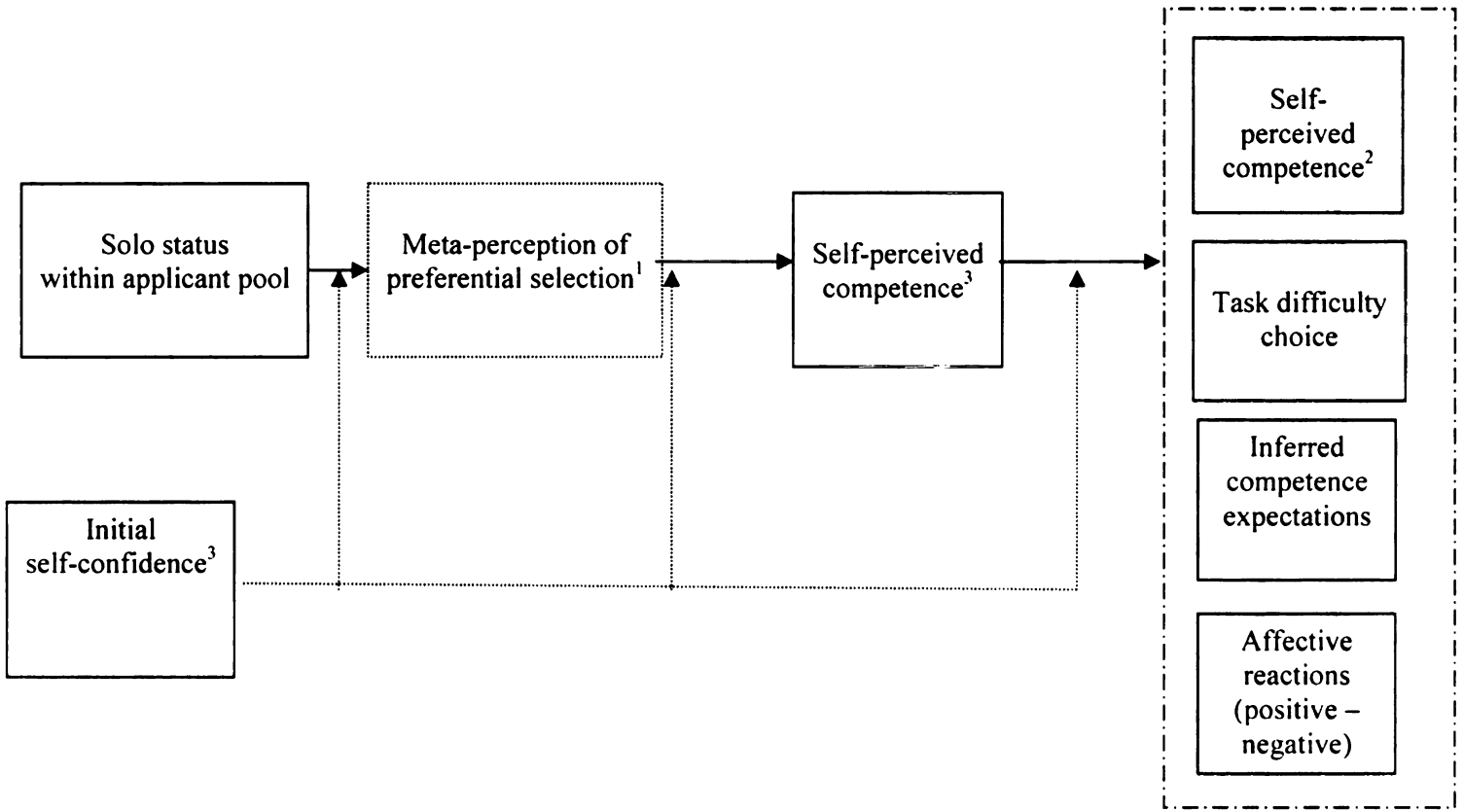
Summary

Although they do not directly speak to the issue, the aforementioned studies (Heilman, 1980; Heilman & Alcott, 2001; Heilman & Blader, 2001) may collectively help to better understand the effects of bearing solo status within an applicant pool on the cognitions, affect, and behavior of newly hired females. Namely, these results can be extrapolated to derive four tentative propositions that collectively imply the framework presented in Figure 3. As before, Heilman and her colleagues have not explicitly advanced this perspective, but it rather it represents how her ideas and research on others' reactions to solos within a selection context might apply to the solos themselves.

Three boundary conditions of Heilman and her colleagues' research should be kept in mind when interpreting the present framework. First, Heilman and her colleagues' research focuses on females operating in traditionally masculine domains (e.g., leadership, management). Second, Heilman and her colleagues' research focuses on people's inferences in the absence of a stated selection policy. Third, Heilman and her colleagues' research focuses on situations in which sex is somehow made salient (e.g., by directly manipulating solo status).

The framework (and the proposed model that follows) is predicated on two key assumptions, the logic of which are rooted in what is known as heuristic processing (i.e., the use of "cognitive shortcuts") to judge a situation, to simplify a decision, or just to manage uncertainty (see Kahneman, Slovic, & Tversky, 1982). Thus, the first assumption is that, since many people engage in heuristic processing (even if unconsciously),

Figure 3. The solo status phenomenon from the perspective Heilman and her colleagues' research.



[1] Heilman and her colleagues manipulated (as opposed to measure) this variable
[2] There is only tentative support for this variable's mediating presence, so it is shown as both a mediator and an outcome
[3] It is unclear what link this variable moderates and the multiple points of moderation reflect this

solos believe that others (e.g., co-workers) make use of some sort of heuristic or "cognitive shortcut" when exposed to what Heilman refers to "something out of the ordinary" – e.g., a newly hired female who bore solo status in her applicant pool – and thus are interested in "making sense of" the situation (Heilman & Blader, 2001; Heilman & Haynes, in press).

The second assumption involves the source of the content of the heuristic (or "cognitive shortcut") that is believed to be present. Specifically, the model that follows is based on the assumption that there exists a relationship between the actual and expected content of the typical (or average) heuristic, lending support to the idea that solos expect others to view them as less competent (than men) and to assume that they were preferentially selected (Heilman, 1980; Heilman & Blader, 2001). Both assumptions are important, as they allow me to use Heilman and her colleagues work on the reactions of others (Heilman, 1980; Heilman & Blader, 2001), to generate hypotheses about one expects the reactions of others to be as well, and, related, to connect the present line of research (which focuses on the effects of bearing solo status) to that of Heilman and Alcott (2001; which focuses on the effects of knowing that others assume you to be preferentially selected).

With the boundary conditions explained and the assumptions noted, I can now describe the four propositions that comprise the implied framework. First, Heilman and her colleagues' research can be extrapolated to suggest that newly hired females solos hold the meta-perception of preferential selection and that this perception may occur through meta-stereotypic conceptions of women as less competent and less likely to succeed. Support for this proposition can also be derived from the results of Heilman

(1980), which suggest that others are less likely to hire solos (than non-solos) and that this effect might occur via the use of sex stereotypes. And, based on the aforementioned assumptions, support can also be derived from the results of Heilman and Blader (2001), which suggest that others perceive female solos as preferentially selected and, moreover, as less competent and less likely to succeed. Thus, these studies establish that, for others (such as solos' co-workers), there exists a link between solo status and the perception of preferential selection, and that stereotype use may mediate this relationship. Thus, I am suggesting that Heilman and her colleagues' research might be extrapolated to suggest the solos themselves are aware of this (similar to arguments made by Jussim, 1986).

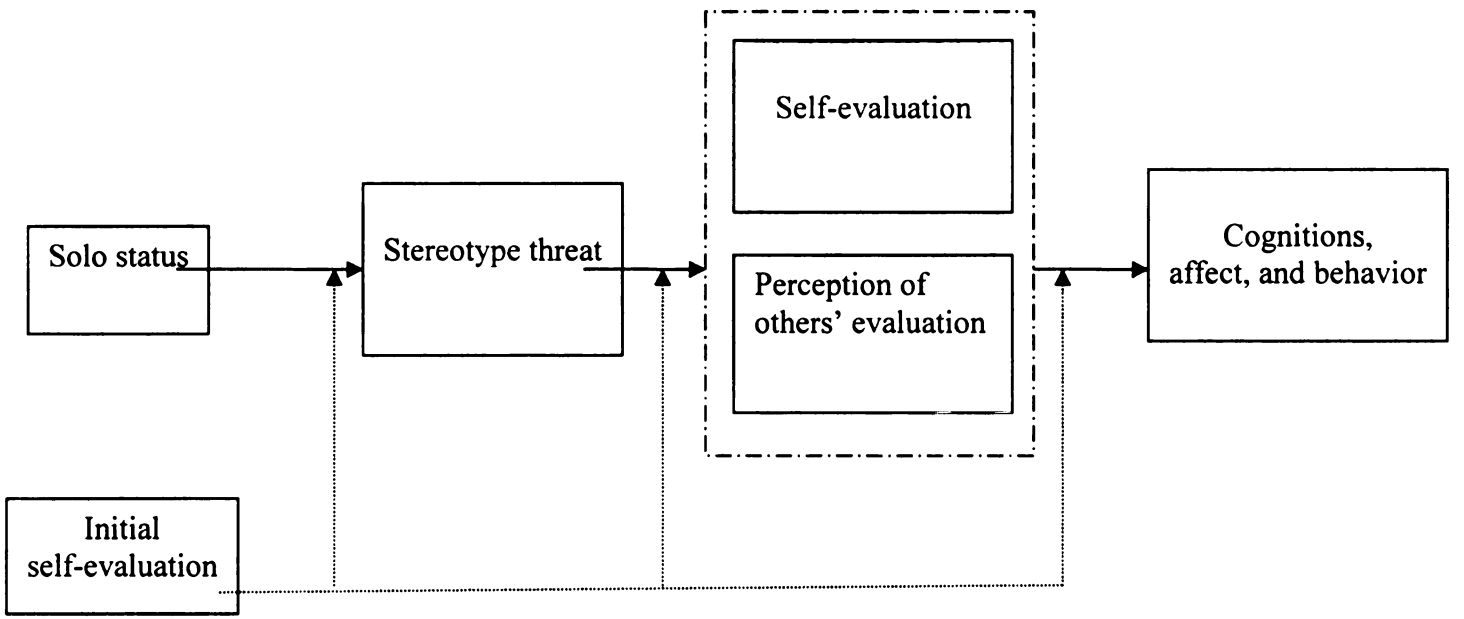
Second, the results of Heilman and Alcott (2001) suggest that the meta-perception of preferential selection negatively relates to desirable outcomes such as self-perceptions of competence, inferred competence expectations, and task difficulty choice. Unfortunately, as is shown in Figure 3, their primary analyses do not reveal the relationships amongst these constructs. Third, Heilman and Alcott's (2001) follow-up analyses provide tentative support for the idea that self-perceptions of competence play a mediating role in the relationship between the meta-perception of preferential selection and cognitions, affect, and behavior. Finally, the results of Heilman and Alcott (2001) suggest that favorable information about ability may buffer the negative effect of the meta-perception of preferential selection on newly hired females cognitions, affect, and behavior.

POINTS OF THEREOTICAL CONVERGENCE BETWEEN THE SOLO STATUS AND STEREOTYPE THREAT LITERATURES

The solo status and stereotype threat literatures point to five broad points of theoretical convergence, which imply the framework shown in Figure 4. The necessary boundary conditions of stereotype threat still apply. Namely, there must be potential for (in this case, unfavorable) evaluation by an out-group member in a valued domain, a negative stereotype must exist (Steele, 1997), the target must be aware of the stereotype, and the target must believe that the relevant entity (i.e., the one making the evaluation) is aware of the stereotype.

First, these literatures converge to suggest that bearing solo status may prompt the solo to experience stereotype threat. This point is most clearly supported by Roberson et al., (2003), who empirically established a link between bearing solo status (within one's workgroup) and self-report measures of stereotype threat (see also Stangor et al., 1998). However, it is also supported by the results of Niemann and Dovidio (1998), who empirically established a link between bearing solo status (within one's department) and perceived distinctiveness, a construct which (as they measure it) "may be closely associated with awareness of stigmatization" (p. 56). Support for the link between solo status and stereotype threat can also be derived from the results of Cohen and Swim (1995), who found that solos (within a workgroup) expect to be unfavorably stereotyped. It can also be derived from the theoretical reasoning of Sekaquaptewa and Thompson (2002), who suggest that negative stereotypic expectations somehow play a role in the

Figure 4. Points of theoretical convergence between the solo status and stereotype threat literatures.



relationship between solo status and desirable cognitions and behavior.

An implication of this first point of convergence is that, when working from the perspective of the solos themselves, the stereotype threat literature subsumes the solo status literature such that the latter is a specific case of the former. That is, stereotype threat can be prompted by many things including bearing solo status (see Table 3), but bearing solo status reliably prompts stereotype threat (Roberson et al., 2003; Stangor et al., 1998; see also Niemann & Dovidio, 1998). This idea is consistent with Kanter (1977a), who suggests that salient minorities (e.g., tokens, solos) "are more easily stereotyped than people found in greater proportions" (p. 211) and with Steele's seminal piece (Steele & Aronson, 1995) in which he refers to solo status as a factor that is "akin to stereotype threat" (p. 798).

A second, related, implication of this first point of convergence is that the framework implied by the solo status literature informs the stereotype threat literature and visa versa. Support for this point can be derived from the fact that the two literatures do not yield any conflicting hypotheses. Indeed, they instead yield nearly identical frameworks (see Figures 1 and 2) that can likely be reconciled by refining their respective terminologies (e.g., perceived distinctiveness). Moreover, many of the studies in the present review draw from both bodies of work to support their arguments (e.g., Inzlicht & Ben-Zeev, 2000; Niemann & Dovidio, 1998; Roberson et al., 2003; Sekaquaptewa & Thompson; 2002; 2003, Stangor et al., 1998; Steele & Aronson, 1995).

Thus, the second point of theoretical convergence is that stereotype threat (resulting from solo status) negatively affects desirable (i.e., performance-facilitating)

cognitions, affect, and behavior. This point is supported by the stereotype threat literature, which has not examined stereotype threat's affective consequences but has linked stereotype threat (resulting from solo status) to lower performance expectancies (Stangor et al., 1998) and to non-optimal feedback-seeking behaviors (Roberson et al., 2003). This point is also consistent with the solo status literature in that solo status has been shown to produce a variety of undesirable cognitions, affect, and behavior (e.g., cognitive deficits, Saenz & Lord, 1989; lower performance, Lord & Saenz, 1985; Sekaquaptewa & Thompson, 2003; lower job satisfaction, Neimann & Dovidio, 1998).

Third, these literatures converge to suggest that the relationship between stereotype threat and cognitions and behavior is mediated by a construct relevant to one's self-evaluation as well as by a construct relevant to one's perception of others' evaluations of one's self. This point is supported by the stereotype threat literature, which suggests that the link between stereotype threat and test performance is mediated by performance expectancies (Cadinu et al., 2003) and by evaluative concerns (Osborne, 2001). It is also supported by the solo status literature, which provides empirical support for the idea that performance expectancies mediate the relationship between solo status and performance (Sekaquaptewa & Thompson, 2003).

Initially, the idea that stereotype threat negatively relates to a construct relevant to one's self-evaluation may seem to be in conflict with the stereotype threat literature, which, as stated previously, has found that those who experience stereotype threat need not endorse the stereotype (e.g., Steele & Aronson, 1995). This issue has not been explicitly discussed within the stereotype threat literature, but, briefly, I argue that stereotype threat can negatively affect, for example, one's self-evaluation of their ability

to receive a favorable evaluation in the relevant context while at the same time have no effect on their overall perception of their ability. This seemingly paradoxical statement is consistent with research on the self-protective properties of stigma (e.g., Crocker & Major, 1989), which suggests that stigmatized individuals attribute negative feedback (or, in this case, anticipated negative feedback) to prejudice against their group. This external attribution is likely easier to make when one call into question the validity of the performance measure by, for example, saying that a supervisor and/or a test is biased.

Finally, these literatures converge to suggest the relationship between stereotype threat and cognitions, affect, and behavior is moderated by a construct relevant to one's initial self-evaluation. Research has not yet examined this moderator in conjunction with the other variables in the model and thus its point of moderation is unclear. Having said that, this general point is most clearly supported by the solo status literature, where Cohen and Swim (1995) found that many of the negative effect of solo status (e.g., preference for a different group) were stronger for women with low (versus high) confidence. This point is also more tangentially supported by the stereotype threat literature, where Stangor et al. (1998) found that stereotype threat had the least detrimental effect on the performance expectancies of individuals who were given reason to believe they were good at the task they were about to perform.

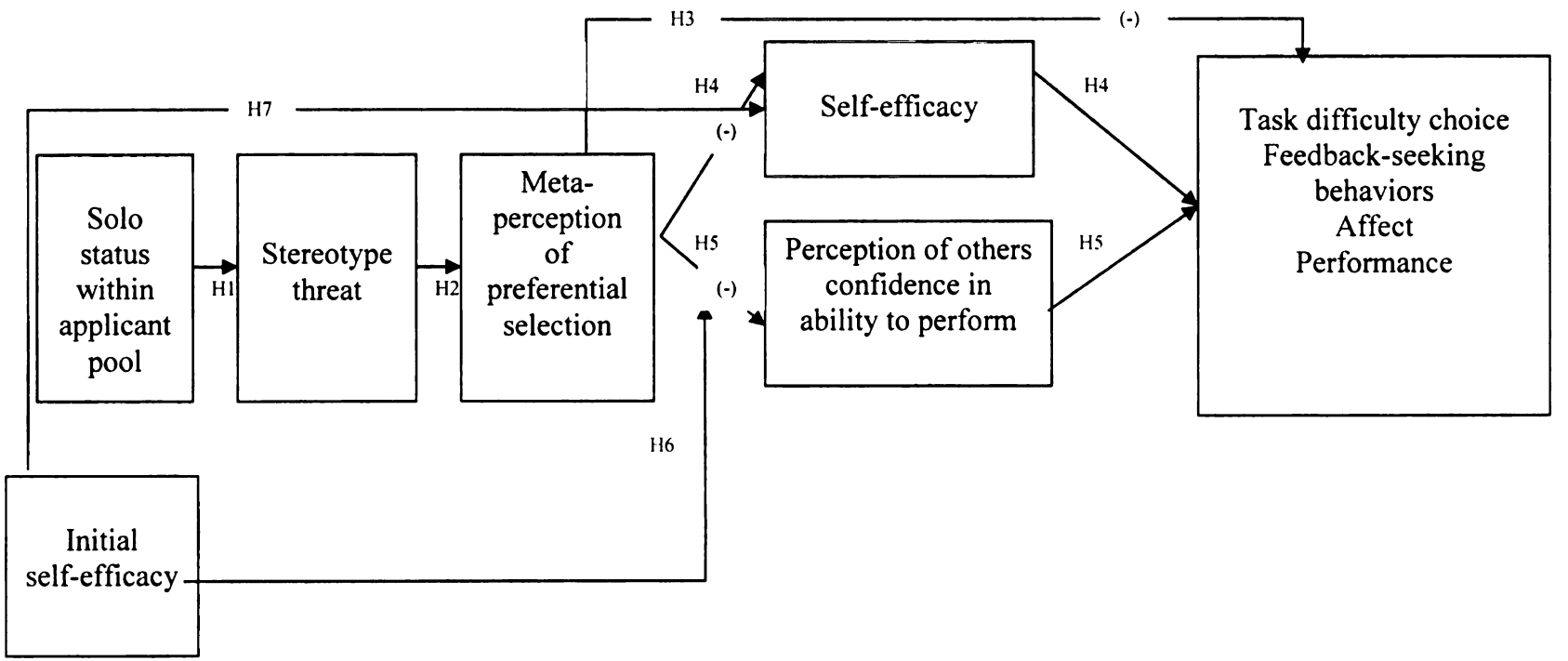
PROPOSED MODEL

Here, using Heilman and her colleagues' research as a guide, I tailor the loose framework shown in Figure 4 to develop a model of the relationship between bearing solo status within an applicant pool and newly hired females' cognitions, affect, and behavior. This model is shown in Figure 5. I will also examine whether this model holds after controlling for cognitive ability.

First, I propose that bearing solo status within an applicant pool prompts stereotype threat. More specifically, bearing solo status prompts the activation of the unfavorable meta-stereotype that women are less competent and less likely to succeed in traditionally masculine jobs. General support for this link comes from the solo status and stereotype threat literatures, which, as previously discussed, converge to suggest that solo status activates stereotype threat.

Specific support for the proposed content of this particular meta-stereotype can be derived from the research of Heilman and her colleagues. Heilman's (1980) work implies that females bearing solo status within an applicant pool are subjected to others' use of detrimental sex stereotypes stating that women are less capable of performing traditionally masculine jobs. Similarly, Heilman and Blader (2001) suggest that females bearing solo status within a newly hired cohort of individuals are assumed by co-workers to be less competent and less likely to succeed. Thus, based on the framework present in Figure 3 and the assumptions that accompany it, I am arguing that the solos themselves are aware of this.

Figure 5. Proposed model.



H1: For newly hired females, bearing solo status within their applicant pool will prompt stereotype threat. More specifically, it will activate unfavorable meta-stereotypic conceptions of women holding traditionally masculine jobs.

Second, I propose that this particular type of stereotype threat (which suggests that women hired for traditionally masculine jobs are less competent and less likely to succeed) will prompt the activation of the meta-perception of preferential selection (in the minds of the solos themselves). This general notion of a meta-stereotype—meta-perception link is consistent with the larger literatures on stereotypes (e.g., Fiske & Taylor, 1991) and meta-stereotypes (Vorauer et al., 1998, 2000), which respectively suggest that stereotype-consistent inferences follow from stereotypes (as a means of perpetuating them) and that meta-stereotypes drive meta-perceptions.

The more specific idea of a link between this particular meta-stereotype and the meta-perception of preferential selection (in the minds of the solos) can be derived from the work of Heilman and her colleagues, who have repeatedly hint at the presence of a similar link in the minds of others. First, Heilman's larger body of work on preferential selection contains repeated suggestions of an association between the "stigma of incompetence" and preferential selection (see Heilman, 1996; Heilman, et al., 1992, Heilman, Block, & Stathatos, 1997). Second, Heilman (1980) found that the use of detrimental sex stereotypes prompted others to make unfavorable selection decisions about the solo, which may suggest that knowledge of the favorable selection decision would prompt assumptions of preferential selection. Finally, this idea is consistent with Heilman and Blader (2001), who suggest that assuming that a solo (in a newly hired

cohort) was preferentially selected "requires far less cognitive exertion than modifying group stereotypes or devising new subgroup categories to account for the unexpected occurrence" (p. 181). Similarly, based on the framework presented in Figure 3 and the assumptions that accompany it, I am arguing that solos are aware of this and thus the meta-perception of preferential selection follows from this particular form of stereotype threat.

> H2: For newly hired female solos, stereotype threat – and, more specifically, unfavorable meta-stereotypic conceptions of women holding traditionally masculine jobs – will prompt the meta-perception of preferential selection.

Third, I propose that the meta-perception of preferential selection will negatively affect cognitions, affect, and behavior. This suggestion is largely consistent with Heilman and Alcott (2001). Thus, this hypothesis largely follows the lead of these authors and proposes that the meta-perception of preferential selection will negatively affect task difficulty choice, affect favorability, and performance. However, it also expands upon Heilman and Alcott's (2001) examination of affectively favorability by suggesting more specifically that the meta-perception of preferential selection will negatively relate to positive aroused affect (e.g., happiness) and positively relate to negative aroused affect (e.g., anxiety). Moreover, I am incorporating Roberson's (2003) ideas about feedback-seeking behaviors. Specifically, Roberson et al. (2003) found stereotype threat to negatively relate to feedback-seeking.

> H3: The meta-perception of preferential selection will negatively affect cognitions, affect, and behavior.
>
> > H3a: The meta-perception of preferential selection will negatively affect task difficulty choice, such that the greater the meta-perception of preferential selection, the less difficult task they will choose.

H3b: The meta-perception of preferential selection negatively will relate to performance.

H3c: The meta-perception of preferential selection negatively relates to positive aroused affect (e.g., happiness) and positively relates to negative aroused affect (e.g., anxiety).

H3d: The meta-perception of preferential selection will negatively relate to feedback-seeking.

Fourth, I propose that the relationship between the meta-perception of preferential selection and cognitions, affect, and behavior will be jointly mediated by individuals' self-efficacy and perception of others' confidence in her ability to perform. This suggestion is consistent with the three streams of research reviewed above. As stated previously, both the solo status and stereotype threat literatures suggest that stereotype threat (occurring as result of solo status) affects cognitions, affect, and behavior through its negative affect on constructs relevant to one's self-evaluation (performance expectancies; Cadinu et al., 2003; Sekaquaptewa & Thompson, 2003) and to one's perception of others' evaluations of one's self (evaluative concerns; Lord & Saenz, 1985; Osborne, 2001; Saenz, 1994; Saenz & Lord, 1989). Thus, it makes sense to argue that any meta-perceptions following from the relevant meta-stereotype will not disrupt this process.

Similarly, Heilman and her colleagues (Heilman & Alcott, 2001) suggest that meta-perception of preferential selection influence cognitions, affect, and behavior via self-perceptions of competence and/or self-efficacy and also note that inferred competence expectations may somehow play a role. Here, I am following these researchers' leads yet at the same time using what I see as the most conceptually and

methodologically appropriate constructs for this particular context: self-efficacy and one's perception of others' confidence in her ability to perform. That is, I am hypothesizing that the meta-perception of preferential selection negatively affects cognitions, affect, and behavior through its negative effect on self-efficacy and on perception of others' confidence in one's ability to perform.

> H4: The relationship between the meta-perception of preferential selection and cognitions, affect, and behavior will be partially mediated by individuals' self-efficacy. More specifically, the meta-perception of preferential selection will affect cognitions, affect, and behavior through its negative effect on self-efficacy, which in turn has a positive effect on cognitions, affect, and behavior.
>
> > H4a: The relationship between the meta-perception of preferential selection and task difficulty choice will be partially mediated by individuals' self-efficacy. More specifically, the meta-perception of preferential selection will affect task difficulty choice through its negative effect on self-efficacy, which in turn has a positive effect on task difficulty choice.
> >
> > H4b: The relationship between the meta-perception of preferential selection and feedback-seeking behaviors will be partially mediated by individuals' self-efficacy. More specifically, the meta-perception of preferential selection will affect feedback-seeking behaviors through its negative effect on self-efficacy, which in turn has a positive effect on feedback-seeking behaviors.
> >
> > H4c: The relationship between the meta-perception of preferential selection and affect will be partially mediated by individuals' self-efficacy. More specifically, the meta-perception of preferential selection will influence affect through its negative effect on self-efficacy, which in turn has a positive effect on affect.
> >
> > H4d: The relationship between the meta-perception of preferential selection and performance will be partially mediated by individuals' self-efficacy. More specifically, the meta-perception of preferential selection will affect

performance through its negative effect on self-efficacy, which in turn has a positive effect on performance.

H5: The relationship between the meta-perception of preferential selection and cognitions, affect, and behavior will be partially mediated by individuals' perception of others' confidence in their ability to perform. More specifically, the meta-perception of preferential selection will affect cognitions, affect, and behavior through its negative effect on individuals' perception of other' confidence in their ability to perform, which in turn has a positive effect on cognitions, affect, and behavior.

H5a: The relationship between the meta-perception of preferential selection and task difficulty choice will be partially mediated by individuals' perception of others' confidence in their ability to perform. More specifically, the meta-perception of preferential selection will affect task difficulty choice through its negative effect on perception of others' confidence in their ability to perform, which in turn has a positive effect on task difficulty choice.

H5b: The relationship between the meta-perception of preferential selection and feedback-seeking behaviors will be partially mediated by individuals' perception of others' confidence in their ability to perform. More specifically, the meta-perception of preferential selection will affect feedback-seeking behaviors through its negative effect on perception of others' confidence in their ability to perform, which in turn has a positive effect on feedback-seeking behaviors.

H5c: The relationship between the meta-perception of preferential selection and affect will be partially mediated by individuals' perception of others' confidence in their ability to perform. More specifically, the meta-perception of preferential selection will influence affect through its negative effect on perception of others' confidence in their ability to perform, which in turn has a positive effect on affect.

H5d: The relationship between the meta-perception of preferential selection and performance will be partially mediated by individuals' perception of others' confidence in their ability to perform. More specifically, the meta-perception of preferential selection will affect performance

> through its negative effect on perception of others' confidence in their ability to perform, which in turn has a positive effect on performance.

Finally, I propose that the relationship between the meta-perception of preferential selection and self-efficacy will be moderated by one's initial self-efficacy, such that individuals with initially higher self-efficacy will experience less detrimental effects to their self-efficacy as a result of the meta-perception of preferential selection than those with initially lower self-efficacy. The general idea that initial feelings of capability can buffer solo status' negative effects is consistent with the three streams of research reviewed above. As stated previously, the solo status and stereotype threat literatures converge to suggest that the relationship between stereotype threat and cognitions, affect, and behavior is moderated by a construct relevant to one's initial self-evaluation (Cohen & Swim, 1995; see also Stangor et al., 1998). Similarly, Heilman and her colleagues (Heilman & Alcott, 2001, Study 2) suggest that the relationship between the meta-perception of preferential selection and task difficulty is positive (as opposed to negative) when participants were given favorable information about their ability.

Although each of these streams of research generally suggests that initial feelings of capability can buffer solo status' negative effects, none clearly specify the exact point of moderation – i.e., the link where initial self-efficacy plays a role. Rather, these studies collectively assess the interactive effect of different independent variables (e.g., solo status; Cohen & Swim, 1995; Stangor, et al., 1998; meta-perception of preferential selection; Heilman & Alcott, 2001) and positive feedback on a variety of outcomes (e.g., desire to change group composition, Cohen & Swim, 1995; performance expectancies, Stangor, et al., 1998; task choice difficulty, Heilman & Alcott, 2001). Here, I am

measuring (rather than manipulating) initial feelings of capability using the construct of self-efficacy and hypothesizing that it acts to buffer solo status' negative effects on cognitions, affect, and behavior by buffering the negative effect of the meta-perception of preferential selection on one's perception of others' confidence in one's ability to perform. That is, the degree to which the meta-perception of preferential selection negatively relates to this variable will depend on one's initial self-efficacy, with those with initially high levels of initial self-efficacy having self-efficacy levels that are more resistant to change. Additionally, initial self-efficacy is not independent of self-efficacy, so I am also hypothesizing that the two will relate to each other.

> H6: The relationship between the meta-perception of preferential selection and one's perception of others' confidence in one's ability to perform will be moderated by one's initial self-efficacy, such that individuals with initially higher self-efficacy will experience less detrimental effects to their self-efficacy as a result of the meta-perception of preferential selection than those with initially lower self-efficacy.

> H7: Initial self-efficacy will relate to self-efficacy.

METHOD

Overview

This study involved recruiting students from two Midwestern college campuses to participate in what they were told was an evaluation of a selection process. Publicity efforts on both campuses invited students to apply for a fictitious job that could be completed over the Internet and, if selected, to work on the "job" for a short time (about 20 minutes). Participants were told that they would have the opportunity to participate in the first phase because it involved applying for the job, but that only those who were "selected" would be asked to participate in the second phase because it actually involved working on the job for a short time. In reality, all participants were told they were selected and given the opportunity to participate in both phases.

The solo status manipulation was delivered at the same time as the favorable selection decision. It involved indicating to female participants that they were the only person of their gender in an otherwise male applicant pool. For this reason, it was necessary to recruit both males and females. Thus, while I collected data from both males and females, I did not analyze the data from males. All further discussion is of the sub-sample of females.

When someone first accessed the site (www.participate-in-research.com), he or she was directed to a page titled, "Introduction to the Study," and then to a Consent Form. After completing the Consent Form, participants began *Phase One* or "the application phase," which involved being asked to provide typical employment test and demographic information. Upon completion of this information, the applicant logged off, submitting her data for evaluation. Within a period of time ranging from 12 to 24 hours

(Monday through Friday), participants received an e-mail message (from selection-decision@participate-in-research.com) notifying them that they had been selected for the job and were given false information about the others in their applicant pool. More specifically, participants were provided with a list of clearly male and/or clearly female names in a manner that suggested that these fictitious individuals were the other people in the applicant pool who were not selected for the job.

Female participants in the solo status condition were given a list of clearly male names (e.g., Jonathon) while those in the non-solo status condition were given a list of clearly male and clearly female names (e.g., Jason, Elizabeth, respectively). The list of clearly opposite sex names was intended to make participants believe that they were the only person of their gender in the applicant pool, while the list of mixed sex names was intended to make them believe that there were people of both sexes in the applicant pool.

The second part of the study was *Phase Two* or "the job phase." Participants who chose to "accept" the job logged back onto the website and were asked to work on the job for a short time (about 20 minute) and then to respond to various survey items. After completing the task and the survey items, the participants signed off, sending the data to the investigator.

Participant Recruitment and Sign-Up Process

Flyers were posted on both campuses and classified advertisements were placed in both campus newspapers to recruit participants for the study. Both media advertised a fictitious job that paid $25 for about an hour and a half of work and briefly explained that this job was part of a research study designed to test an online selection system. Interested parties were directed to the website for the details. The flyers also explained

the payment schedule. Participants were paid $10 for participating in Phase One (the application phase) and another $15 for participating in Phase Two (the job phase). Additionally, it was explained that a $10 bonus would be given to the top performers in Phase Two, with the odds of winning equal to approximately one in ten.

Interested parties who visited the site were directed to a page titled, "Introduction to the Study," which explained that this was a research study and communicated a cover story intended to make potential participants feel as if they were actually going to be part of a selection process. The website stated that the purpose of the study was to examine the feasibility of having campus recruiters conduct the first phase of a company's selection process online rather than on-site to save on expenses (e.g., airfare). Next, the web page asked interested participants to click on a link that directed them to a page titled, "Consent Form" that explained the activities included in the study in more detail and reviewed their rights as a participant. The bottom of the Consent Form indicated that students who wished to participate in the experiment could indicate this by typing their name and student identification number into the fields provided. Those who were not interested could simply exit the website.

Key Features of the Cover Story

The website stated the organization was interested in applicants for a "managerial internship." The reason that the internship was specifically a managerial one was because I wanted the job to be perceived as at least somewhat masculine by the participants themselves, as this was one of the boundary conditions of my proposed model (previously shown in Figure 5). I unfortunately failed to ask participants any questions about whether they actually perceived the job to be a masculine one or not. The

implications of this oversight will be addressed in the discussion section. For now, it is only necessary to mention that any effects of solo status in the present study are likely to be weaker and thus more difficult to detect to the extent that the job was actually not perceived to be a masculine one (Karakowsky & Siegel, 1999; see also Carr, 2001; Dipboye, 1985; Heilman, 1983; 2001). That is, any effects of solo status detected within the present study should be stronger in situations where the job is perceived to be more masculine than the one in the present study.

There is some evidence to support the idea that the aforementioned managerial internship was perceived by participants to be at least somewhat masculine. Although management jobs are "neutral" in an objective sense, (Powell & Graves, 2003) they are "masculine" in a subjective one such that management is still associated with men in the minds of Americans (Powell, Butterfield, & Parent, 2002; Sabine & Sczesny, 2003). However, to bolster the perception that this internship was a masculine one, the website stated that the company with which the research team was working was a "communication and technology organization." This phrasing is meaningful because "technology jobs" (i.e., scientific, technical, and engineering occupations; Bureau of Labor Statistics, 1999) are objectively more frequently held by men and thus referred to as "masculine" (Powell & Graves, 2003; U.S. Department of Labor, 2003).

The website also explained that, after the study was over, "actual managers" from the organization would review the entire applicant pool to determine how qualified the managers thought that the selected and unselected applicants were. Including these "actual managers" in the cover story was intended to create the sense that the applicant would be evaluated by others at a later point in time.

Procedure

At the beginning of Phase One (the application phase), participants were asked to provide demographic data. The main information of interest here was the self-reported gender of the participants, which was used along with the randomly assigned solo status condition to determine the content of the e-mail message that communicated the selection decision. Participants were also asked to provide other information (e.g., race, score on their college entrance exam). After being given a short description of the job for which they would be applying, participants were asked to respond to survey items used to measure their level of initial self-efficacy to perform the job. At the end of Phase One, participants were asked to spend 15 minutes taking a selection test. At the completion of the selection test, they sent in the application by clicking the link provided to them.

Within a period ranging from 12 to 24 hours (Monday through Friday), participants received an e-mail message notifying them that they were selected. This e-mail message also contained the solo status manipulation in the form of the names of all others in the applicant pool. The participants were instructed to continue to the second phase by clicking on a link provided in the notification of hire e-mail.

At the beginning of Phase Two (the job phase), participants were asked to respond for a second time to items used to measure their self-efficacy to perform the job. They were also asked to estimate the extent to which they expected their manager to perceive them as capable of performing the job. Next, participants were asked to select the difficulty level of the job they were about to complete and then allowed 20 minutes to work on the task. In reality, all participants were presented with the same version of the task (regardless of their choice of difficulty). Then, after spending 20 minutes on the job,

participants were asked to respond to a variety of items used to measure stereotype threat, the meta-perception of preferential selection, affect, and feedback-seeking. More information on the order in which the measures were administered is provided shortly. For now it is worth noting that the order in which I administered the measures did not directly correspond to the proposed model (shown in Figure 5) because I did not want to risk alerting participants to the nature of the study before collecting the outcome information.

Study Design and Participants

This study was a one-factor design with two levels, solo status or non-solo status. A total of 442 people visited the website and provided a name and an e-mail address, but many of these cases were omitted from the data set. First, of the 442, a total of 167 were males and two did not indicate their gender. Among the 273 females remaining in the sample, about a third (n = 96) failed to click on the link provided in the notification of hire e-mail and thus were paid only for participating in Phase One. The rest (N = 177), who completed both phases and were paid accordingly, comprise the sample for the present study. Of these 177 cases, six provided logically impossible responses to a subset of items, reducing the number of eligible participants to 171.

The remaining participants' age ranged from 18 to 51 with a median age of 20 and an average age of 20.85 (SD = 3.41). The majority (86%) of respondents were White (n = 147). Remaining respondents reported being Black or African American (n = 16), Asian (n = 3), Mexican American (n = 2), Biracial (n = 2), or "other" (n = 1). Participants reported being reasonably comfortable (M = 3.77; SD = 1.54) with computers on a 5-point Likert scale (*very uncomfortable – very comfortable*).

Among the 171 remaining participants, 25 reported being unable to submit their job performance data or move forward with the study. The computer programmer (who designed the website) suspected that these participants were using an older web browser that did not meet the system requirements of the original program. The programming code was revised and the problem eventually fixed, but not in time to make it appropriate to ask these individuals to check back and finish the study. Thus, as shown in Table 5, there are 143 to 146 cases per variable from the point of the work sample forward. The lowest pairwise sample for each hypothesis is 143.

Table 5

Study Measures and Sample Sizes

Measures[a]	Sample size
Initial self-efficacy	171
Selection test	171
Self-efficacy	171
POCA[b]	171
Task difficulty choice	170
Performance[c]	146
Affect	143
Stereotype Threat	143
MPPS[d]	144
Feedback-seeking	143
Listwise	136

[a]The measures are listed in order of administration. [b]POCA is an abbreviation for "perceptions of others' confidence in one's own ability" [c]Participants were told that they were going to perform the job by completing a work sample. [d]MPPS is an abbreviation for "meta-perception of preferential selection"

Results of analyses comparing cases that were included in the analyses versus those who were not, at multiple stages, are provided in Appendix B. While no concerning trends were observed, participants who moved on to the second phase of the study were older, scored higher on the selection test, and were white to a greater proportion than those who did not move on to the second phase. Additionally, those who successfully submitted their work sample in Phase Two had selected a more difficult task.

With one degree of freedom, these 143 participants provide enough statistical power (80%; Murphy & Myors, 1998) to detect an effect size of .46 via the regression-based analyses used for the individual hypothesis tests. Previous, similar research has yielded effect sizes ranging from -.63 to -.76 (e.g., Sekaquaptewa & Thompson, 2003). This sample of 143 participants also provides sufficient power for the path analyses used to completely and simultaneously test the 15 parameter in the model., as ten to 20 cases per estimated parameter have been described as sufficient to ideal, respectively (e.g., Kline, 1998, p. 112; Tabachnick & Fidell, 2001, pp. 659-660).

Solo Status Manipulation

In an effort to balance experimental control and external validity, I did not directly inform participants of their solo status but rather I gave them information about the gender of the fictitious others in their applicant pool (see Figure 6). Specifically, participants in the solo status condition received an e-mail stating, "Human Resource (HR) personnel from the communication and technology organization compared your application to the most recent group of applications processed (6 males, 0 females). Congratulations, HR decided to select you for this job." The message listed all the "applicants'" names along with their unfavorable selection decision, and the participant's

names were always second from the bottom. Included in this e-mail was a link to the study itself, and the content of the first page that participants saw upon clicking this link was a replicate of the information contained in the e-mail message.

Participants in the control condition received a similar e-mail message linked to a similar web page, but they were told that there were three males and three females in the applicant pool and provided a list of male and female applicant names.

Figure 6. Content of e-mail message sent to participants in the non-solo condition.

-----Original Message-----
From: selection-decision@participate-in-research.com
Subject: Selection decision

Human Resource (HR) personnel from the communication and technology organization compared your application to the most recent group of applications processed (3 males, 3 females). Congratulations, HR decided to select you for this job.

Applicant	Selection Decision
Greg Ruffner	Rejected
Harry Robinson	Rejected
Carla Spretizer	Rejected
Jason Wyckoff	Rejected
Jodi Wilmont	Rejected
[Participant's name]	Accepted
Elizabeth Daly	Rejected

You have one week to complete the second half of the study. Visit http://participate-in-research.com/step4.php?ssn=[Participant's identification number] when you are ready to do so.

Measures

Self-Efficacy

Since participants' "job" involved generating unique schedules, the purpose of the self-efficacy measure was to assess how confident participants felt in their capability to complete a certain number of unique schedules (e.g. eight) within the 15-minute time limit. To do this, I administered a 16-item version of Maurer and Pierce's (1998) version of Lee and Bobko's self-efficacy (1994) scale that uses a 5-point Likert scale asking participants to rate how strongly they agreed with a series of performance statements (e.g., "I can complete eight or more schedules"). I administered this measure twice to get participants' initial self-efficacy as well as their self-efficacy after receiving the positive selection outcome. This measure was reliable on both occasions (α = .96 and α = .95, respectively). This scale appears in Appendix A.

Selection Test

The selection test was actually a cognitive ability test. Specifically, I administered the Raven's Advanced Progressive Matrices (Raven's; Raven, Court, & Raven, 1985), a non-verbal test that is considered a general test of cognitive ability (Carroll, 1993; Snow, Kyllonen, & Marshalek, 1984). The test consists of 36 matrix or design problems arranged in ascending order of difficulty with the score being the total number of problems solved correctly. As pointed out by Mayer and Hanges (2003), one of the advantages of this test was that its ambiguous form can easily be explained to participants as either an intelligence test or a test of some other construct (e.g., analytical and problem solving skills). The instructions included language intended to convince participants of its face validity: "To help us determine whether or not you are qualified to be a managerial

intern at this communication and technology organization, you are about to take a test that measures your analytical and problem solving skills. Previous studies suggest that this test is a valid predictor of job performance." Participants' average response (using a 5-point Likert scale) to the four items placed at the end of the study to assess the test's face validity (see Appendix A) was 2.97. This neutral value indicates that, on average, participants neither agreed nor disagreed that the test was face valid. Participants were asked to spend 15 minutes on the selection test, and a timer embedded in the computer program told them when their time was up. The results of the present study indicate that the Raven's was reliable (KR20 = .89).

Perception of Others' Confidence in One's Own Ability

Items were adapted from two sources to create a measure of the perception of others' confidence in one's own ability (POCA). The first source was a measure created by Heilman and Alcott (2001) to assess "inferred competence expectations" and the second was a measure created by Tyler and Blader (2002a; 2002b) to assess others' respect for one's work (Tyler & Blader, 2002a). Heilman and Alcott (2001) asked participants to respond to two items asking them to infer their teammate's perception of their competence and likelihood of being successful at the task as well and one item asking them to provide their expected level of performance. All ratings were made on 9-point response scales, with anchors ranging from "very much" to "not at all" for the first two items and from "very well" to "very poorly" for the last one. The scale was reliable (α = .86). Tyler and Blader (2002a; 2002b) asked participants to rate the extent to which others (i.e., co-workers) respect the work they did and their ideas as well as the extent to which they value their contributions at work. All ratings were made with a 5-point scale

(strongly agree – strongly disagree) and the scale proved to be reliable (α = .95; Tyler & Blader, 2002a).

In the present study, I adapted items from each of these scales to measure participants' perception of the organizations managers' beliefs about their capability. A principal axis factor analysis indicated that this measure has one factor (Table 6). It was also reliable (α = .93).

Table 6

Exploratory Factor Analysis Results for POCA[b] Measure Using Principal Axis Factoring (N = 143)

Item[a]	Factor Loading
1. Respect the work I do	.86
2. Respect my ideas	.83
3. Value what I would contribute to the organization	.88
4. Think it would be difficult to replace me	.69
5. Disapprove of how I do my work (R)	.46
6. Appreciate my contributions to the organization	.83
7. Perceive me as competent	.77
8. Perceive me as likely to be successful on the job	.85
9. Expect me to perform the job well	.78
% of variance	61.02%

Note. (R) indicates that the item was reverse-coded.
[a]Each item began with the phrase, "This organization's managers will."
[b] POCA is an abbreviation for "perceptions of others' confidence in one's own ability"

Work Sample Performance

Participants were asked to spend 20 minutes on a work sample in Phase Two and were told that doing so was the "job phase" of the study, meaning it was one in which their job performance would be evaluated. As before, a timer embedded in the computer program told participants when their time was up. The work sample was an adaptation of

a class scheduling task originally developed for goal-setting research (Early & Kanfer, 1985; see also Q. Roberson, Moye, & Locke, 1999; Steele-Johnson, Beuregard, Hoover & Schmidt, 2000). The author had previously (Carr, 2001) adapted this task for use in a similar study (e.g., it was also conducted online). It produced variability in participants' performance (M = 3.54; SD = 3.42) and performance on it related to various other constructs, such as self efficacy (r = .22, p < .001), self-evaluations of performance (r =. 67, p < .001), and the perceived fairness of the selection decision (r = .18, p < .001).

This class scheduling task was adapted to fit with the present study. In this case, the task was presented as an inventory scheduling task (rather than an academic course scheduling task [Early & Kanfer, 1985] or as a conference room scheduling task [Carr, 2001]). Participants were told that the organization was investigating the quality and reliability of their suppliers and, for this reason, wanted the managerial interns to develop as many unique inventory schedules as possible. Participants were provided with the names of twelve suppliers, each with several possible inventory times, and a list of the schedule constraints. Each schedule needed to be unique and contain five different supplier codes within the same month was "valid." More information about this task is in Appendix C.

It is important to mention that over half the participants (n = 88) had zero valid schedules, indicating a floor effect. This was unexpected because there was no such effect in Carr (2001). Later, I address possible explanations for why there was a floor effect in this study and not in the other. For now, it is worth noting that this floor effect means that the performance data collected in the present study must be interpreted with

caution. Moreover, it is important to keep in mind that participants likely were able to infer (at least to some extent) that they were not doing well on the task.

Affect

Affect was measured using Davis's (2001) four-factor scale, which was adapted from Spielberger's State-Trait Anxiety Inventory (Spielberger, 1983). The scale measures four related components of affect (positive aroused, negative aroused, positive calm, and negative calm) and it is consistent with existing perspectives on the dimensionality of affect (see Bagozzi, 2003; Frijda, 1999; c.f., Russell & Carroll, 1999). The items asked participants what types of affect they were experiencing – i.e., "how they felt" – while performing the task (e.g., happy, anxious, etc.) All ratings were made with a 5-point Likert scale (strongly disagree – strongly agree).

The results of a principal axis factor analysis with oblique rotation (see Table 7) are supportive of the four-factor solution: (a) Negative calm (seven items; e.g., "disappointed"), (b) Positive aroused (five items; e.g., "enthusiastic"), (c) Positive calm (five items; e.g., "relaxed"), and (d) Negative aroused (four items; e.g., "tense"). As shown in Table 8, the scales relate highly to each other, indicating a low level of discriminant validity, but are reliable (with internal consistencies ranging from .89 to .93).

However, because the meta-perception of preferential selection was only hypothesized to relate to positive aroused affect (negatively) and negative aroused affect (positively), only these two scales were used in the subsequent analyses.

Table 7

Results of Principal Axis Factor Analysis with Oblique Rotation for Affect Measure

No.	Item Content	Factor Loadings			
		Negative Calm	Positive Calm	Negative Aroused	Positive Aroused
8	Discouraged	**0.81**	-0.23	0.17	-0.28
6	Disheartened	**0.75**	-0.12	0.33	-0.06
10	Dissatisfied	**0.74**	-0.29	-0.06	-0.27
1	Disappointed	**0.73**	-0.28	-0.03	-0.10
2	Frustrated	**0.67**	-0.29	0.35	-0.16
21	Annoyed	**0.62**	0.05	0.16	-0.17
7	Discontent	**0.73**	-0.13	0.40	-0.15
20	Content	-0.33	**0.79**	-0.06	0.16
16	Calm	-0.19	**0.79**	-0.31	-0.02
18	Delighted	-0.18	**0.75**	-0.15	**0.45**
19	Relaxed	0.08	**0.75**	-0.46	0.13
15	Secure	**-0.45**	**0.67**	-0.05	0.26
5	"On edge"	0.23	-0.14	**0.86**	-0.13
3	Anxious	0.07	-0.20	**0.83**	0.16
4	Tense	0.33	-0.15	**0.80**	0.02
9	Stressed	**0.50**	-0.37	**0.51**	-0.25
11	Eager	-0.18	-0.11	0.09	**0.79**
14	Excited	-0.28	0.35	0.01	**0.77**
17	Enthusiastic	-0.16	**0.49**	-0.03	**0.71**
13	Happy	-0.29	**0.52**	-0.13	**0.65**
12	Cheerful	-0.25	**0.58**	0.19	**0.59**
	Eigenvalues	4.77	4.34	3.18	3.15
	% of variance	22.7%	20.66%	15.16%	15.02%

Note. N = 142, Factor loadings over .40 appear in bold.

Table 8

Intercorrelations and Internal Consistency Reliabilities for Affect Factors

	1	2	3	4
1. Positive Aroused	.93			
2. Positive Calm	.67	.89		
3. Negative Aroused	-.25	-.56	.90	
4. Negative Calm	-.48	-.60	.72	.89

Note. All correlations off diagonal significant at the 0.01 level (2-tailed). Reliability coefficients shown on the diagonal.

Task Difficulty Choice

This one-item measure asked participants to choose how difficult they would like their work sample (i.e., "job") to be. Participants had three response options: easy, moderate, and difficult (coded as one, two, and three respectively). All three tasks were in reality the same task and thus of the same difficulty level, so it was important to carefully consider the best way to handle participants' perception of the relationship between task difficulty choice and eligibility for cash prizes. For example, if participants were told, "The top 10% of performers in each condition will receive a $10 prize," the participants may have been angry when they found out (at the end of the study) that all tasks were identical in terms of difficulty level. Thus, participants were just told that this choice would be "taken into account" when awarding cash prizes. Most participants either chose the moderately difficult task (n = 87) or the easy task (n = 61), although some chose the most difficult one (n = 23).

Feedback-Seeking

The items of this measure asked participants how important it was for them to receive feedback on their performance on the task. Specifically, three items (adapted from Carr & Deshon, 2001) asked participants to rate the extent to which it was important to have information about how well others performed on the task, about how to improve their understanding of the task, and about how well they performed relative to others. All ratings were made with a 5-point Likert scale (strongly disagree – strongly agree). This measure was reliable (α = .88).

Stereotype Threat

This measure of stereotype threat was adapted from a previous measure of the construct (Roberson et al., 2003; α = .77; see Appendix A). The first adaptation was straightforward: The word "sex" replaced the word "race" in all items. For example, I changed "My race does not..." to "My sex does not..." The second adaptation, which was more complicated than the first, requires the reader to recall that stereotype threat does not involve self-stereotypes (i.e., those pertaining to one's own group; c.f., Wheeler & Petty, 2001) but rather meta-stereotypes. That is, while an item assessing a self-stereotype might say, "Cognitive ability tests may be easier to perform for people of my race," an item assessing a meta-stereotype might say, "*Others will think* cognitive ability tests are easier..."

The third adaptation follows from the second such that I revised the items so that they specifically referred to "this organization's managers," which I "introduced" to the participants in the beginning of the study (i.e., when I communicated the cover story). Thus, I adapted the items so that, instead of the generic "others" statement, they refer to

"this organization's managers." A specific example (that extends the aforementioned generic example) of this (taken directly from the present study) is that I changed "Cognitive ability tests may be easier to perform for people of my race" to "*This organization's managers* will think my *job* is easier for people of my *sex* to perform."

This five-item scale had a very low coefficient alpha (α = .49). An inspection of the corrected item-total correlations revealed that item two, "This organization's managers will think my job is easier for people of my sex to perform," had a value of -.62. This may have been because participants may have misinterpreted the item. Thus, I dropped the item, leaving a four item scale with good reliability (α = .86). A principal axis factor analysis yielded one factor (see Table 9).

Table 9

Exploratory Factor Analysis Results for Final Stereotype Threat Measure Using Principal Axis Factoring (N = 143)

Item	Factor Loading
1. This organization's managers will think I have less ability to perform this job because of my sex.	.90
2. This organization's managers will expect me to perform poorly because of my sex.	.92
3. People of my sex will face biased evaluations from this organization's managers.	.91
4. My sex will not affect managers' perceptions of my ability to perform this job (R)	.40
Eigenvalue	2.65
% of variance	66.33%

Note. (R) indicates that the item was reverse-coded.

Meta-Perception of Preferential Selection

This measure asked participants to rate the extent to which they believed the organization's managers would assume that the participant had been hired based on merit (vs. sex). I adapted the items from Heilman and Blader's (2001) measure of "assumed gender-based preferential selection." Heilman and Blader (2001) asked participants to rate the extent to which participants thought several different factors played a role in the decision to admit the target student, one of which was the applicant's gender (played a large role/played no role at all; p. 190). The measure used for the present study was also a derivation of Heilman and Alcott's (2001) manipulation of "implied selection method," where the authors varied information given to participants intended to "reveal" to them their (confederate) teammates' perception of the reason they, the participants, were selected (i.e., on the basis of merit or sex).

Specifically, participants in the present study were asked to use a 5-point Likert scale to rate the extent to which they agreed with five statements about the basis on which the organization's managers would think they were selected. The measure had two "key items" and three "distracter items." The "key items" read as follows: "This organization's managers will think that my sex played a large role in Human Resource's decision to select me for this job" and "This organization's managers will think that my performance on the selection test played a large role in Human Resource's decision to select me for this job." The "distracter items" corresponded to the aforementioned demographic information that was requested from participants (e.g., race, college admissions test score).

A programming error that went undetected until all but 15 of the female participants had completed the study resulted in the remaining participants' responses to the key item ("This organization's managers will think that my gender played a large role Human Resources' decision to select me for this job") not being recorded. Analyses were conducted on the remaining item, which asked what role the organization's managers would think that the applicant's performance on the selection test played a large role in HR's decision to select her for the job. This error is an obvious limitation of the study, the implications of which will be addressed in the discussion section. For now, it means that I will refer to MPPS as "the belief that one was not selected on the basis of the selection test," as this more accurately describes the remaining item.

The remaining item of the meta-perception of preferential selection measure ("This organization's managers will think that I was selected on the basis of my performance on the selection test") was reverse-coded to remain consistent with hypotheses about the meta-perception of preferential selection (see Figure 5). It is an open question as to whether responses to this (reverse-coded) item would have correlated positively with those to the aforementioned gender one (to which only 15 responses were recorded). However, with the very small and under-powered pairwise sample of 15, I found the correlation between these two items to be non-significant but positive, $r = .31$, $p > .05$. Based on the magnitude of this correlation, I believe that the full sample's responses to the retained item would have significantly (and positively) related to the lost gender item.

RESULTS

Manipulation Check

The solo status manipulation check was one item that asked participants to rate the extent to which they agreed with the statement, "There were other people of my gender in the applicant pool." The item used a 5-point Likert response format where 1 indicated "strongly disagree" and 5 indicated "strongly agree." To investigate if participants in the solo condition were less likely to agree with this statement than those in the non-solo condition, a t-test was conducted. Participants in the solo status condition were less likely to agree with this statement (M = 2.34, SD = 1.41) than those in the non-solo status condition (M = 4.19, SD = .95), t (144) = 9.15, $p < .001$. An examination of the response distributions is consistent with this. The proportion of participants endorsing a 3 or higher (i.e., "neither agree nor disagree") was 37% for the solo status condition versus 78% for the non-solo status condition. Thus, these results suggest that the solo status manipulation was effective.

Tests of Hypotheses and Model

Table 10 presents the means and standard deviations of the major study variables (overall and by condition). Table 11 presents the reliability coefficients and intercorrelations of the major study variables. The results are presented in two sections. First, I present result of analyses that specifically test each hypothesis in isolation. However, these hypotheses may be better understood as an interrelated set of complex indirect effects. Therefore, the second section presents a series of path analyses that provide an overall evaluation of the model proposed here that accounts for the interrelationships among all the variables of interest.

Table 10

Means And Standard Deviations of Major Study Variables

	Overall			Solo Condition			Non-solo condition		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
1. Solo status	171	n/a	n/a	90	n/a	n/a	81	n/a	n/a
2. Initial self-efficacy	171	3.29	.89	90	3.31	.91	81	3.27	.87
3. Selection test	165	18.19	6.34	87	18.54	6.87	78	17.79	5.71
4. Self-efficacy	171	3.49	.86	90	3.43	.94	81	3.56	.76
5. POCA[a]	171	4.19	.71	90	4.15	.82	81	4.24	.56
6. TDC[b]	170	1.77	.67	89	1.80	.71	81	1.75	.62
7. Performance[c]	146	.91	1.49	77	.88	1.59	69	.94	1.37
8. Positive aroused	143	2.86	.91	76	2.88	.94	67	2.89	.88
9. Negative aroused	143	3.39	1.02	76	3.35	1.03	67	3.43	1.02
10. Stereotype threat	143	2.07	.87	76	2.02	.84	67	2.12	.91
11. MPPS[d]	144	2.04	1.11	77	2.22	1.19	67	1.84	.98
12. Feedback-seeking	143	3.47	1.12	76	3.53	1.13	67	3.41	1.11

Note. All scales on a 5-point Likert scale (where 1=strongly disagree and 5=strongly agree) except the selection test, task difficulty choice, and performance. The selection test score represents number of problems correct out of 36; Performance represents number of unique valid schedules generated. Task difficulty choice ranges from 1 to 3, with 1 being the easiest and 3 being the most difficult. *n* = sample size; *M* = mean; *SD* = standard deviation; n/a = not applicable.

[a]POCA is an abbreviation for "perceptions of others' confidence in one's own ability" [b]TDC is an abbreviation for task difficulty choice [c]Participants were told that they were going to perform the job by completing a work sample. [d]MPPS is an abbreviation for "meta-perception of preferential selection" but, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test"

Table 11

Reliability Coefficients and Intercorrelations of Major Study Variables

	n	1	2	3	4	5	6	7	8	9	10	11	12
1. Solo status	171	n/a											
2. Initial self-efficacy	171	.02	.96										
3. Selection test	165	.06	.14	.89									
4. Self-efficacy	171	-.07	.71	.19	.95								
5. POCA[a]	171	-.13	.41	-.29	.56	.93							
6. TDC[b]	170	.03	.25	.43	.26	.24	n/a						
7. Performance[c]	146	-.02	.15	.27	.07	.17	.20	n/a					
8. Positive aroused	143	-.02	.02	.15	.17	.09	.09	.16	.89				
9. Negative aroused	143	-.04	.00	-.12	.09	-.04	-.04	-.25	-.56	.89			
10. Stereotype threat	143	-.06	-.24	-.12	-.18	-.13	.00	-.03	-.10	.31	.86		
11. MPPS[d]	144	.17	-.12	-.09	-.28	-.28	-.03	-.16	-.09	.04	.14	n/a	
12. Feedback-seeking	143	.06	.03	.19	.12	.21	-.01	.06	-.05	.08	.13	-.33	.88

Note. Reliability coefficients shown on the diagonal; Correlations greater than or equal to .17 are significant at the .05 level (two-tailed).

[a]POCA is an abbreviation for "perceptions of others' confidence in one's own ability" [b]TDC is an abbreviation for task difficulty choice [c]Participants were told that they were going to perform the job by completing a work sample. [d]MPPS is an abbreviation for "meta-perception of preferential selection" but, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test"

Individual Hypothesis Tests

To test Hypothesis 1 (which predicted a positive relationship between solo status and stereotype threat), I conducted a one-tailed independent-samples t-test on the stereotype threat composite score. Solo participants' responses (M = 2.02, SD = .84) were not significantly different than the non-solo participants (M = 2.12, SD = .91), t (141) = .738, $p > .05$. Thus, there was no support for Hypothesis 1.

To test Hypothesis 2 (which suggests a positive relationship between stereotype threat and the meta-perception of preferential selection), I computed a correlation between perceptions of stereotype threat and the meta-perception of preferential selection scale. The correlation revealed that perceived stereotype threat did not significantly relate to meta-perception of preferential selection (which, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test"), r = .14, $p > .05$, one tailed. Thus, there was no support for Hypothesis 2.

To test Hypothesis 3 (which suggests that the meta-perception of preferential selection will negatively relate to cognitions, affect, and behavior), I examined the correlations between the meta-perception of preferential selection and the following dependent variables: task difficulty choice, feedback-seeking, positive aroused affect, negative aroused affect, and work sample performance (i.e., score on the scheduling task). As shown in Table 11, the meta-perception of preferential selection significantly negatively related to feedback-seeking (r = - .33, $p < .001$). That is, consistent with Hypothesis 3, the higher the meta-perception of preferential selection (which, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test"), the less likely the participants were to report wanting feedback.

However, the meta-perception of preferential selection did not significantly relate to the remaining dependent variables. Thus, there was partial support for Hypothesis 3.

Hypothesis 4 suggests that that the relationship between one's meta-perception of preferential selection and cognitions, affect, and behavior is partially mediated by the meta-perception of preferential selection. Hypothesis 5 suggests the same relationship is partially mediated by POCA (one's perceptions of others' confidence in one's own ability to perform). The first step of testing each of these mediation hypotheses was to show that the meta-perception of preferential selection (which, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test"), relates to the dependent variable of interest (Baron & Kenny, 1986). As stated previously, the meta-perception of preferential selection significantly related only to feedback-seeking (r = - .33, p < .001), so subsequent steps focused only on this relationship.

The second step of testing the mediation hypotheses was to show that the proposed mediators (i.e., self-efficacy, POCA) relate to the independent variable (i.e., the meta-perception of preferential selection). As shown in Table 11, the meta-perception of preferential selection significantly negatively related to self-efficacy (r = -.28, p < .05) and to POCA (r = -.28, p < .05), so this second step was satisfied for both hypotheses.

The third step of testing the mediation hypotheses was to show that the proposed mediators relate to the dependent variable while the independent variable was held constant. As shown in Tables 12a and 12b, the relationships between feedback-seeking and the two mediators (i.e., self-efficacy, POCA) were no longer significant after controlling for the meta-perception of preferential selection. Not satisfying this third step

precludes one from going on to the fourth step. Thus, based on these analyses, there is no support for Hypotheses 4 and 5.

Table 12a

The Relationship Between Self-Efficacy and Feedback-Seeking, Controlling for MPPS[a]

Independent variables	B	Standard Error	t-statistic	*p*	R^2
MPPS	-.33	.084	-3.88	0	
Self-efficacy	.004	.11	.40	.69	.11

Note. Dependent variable: Feedback-seeking; degrees of freedom = 2; sample size=141; B = unstandardized beta weight; R^2 = variance explained.
[a] MPPS is an abbreviation for "meta-perception of preferential selection", but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test"

Table 12b

The Relationship Between POCA[a] *and Feedback-Seeking, Controlling for MPPS*[b]

Independent variable	B	Standard Error	t-statistic	*p*	R^2
MPPS	-.29	.08	-3.53	.001	
POCA	.22	.13	1.68	.10	.13

Note. df = 2; sample size=141; B = unstandardized beta weight; α = significance level; R^2 = variance explained.
[a] POCA is an abbreviation for "perceptions of others' confidence in one's own ability"

To test Hypothesis 6 (which suggests that the relationship between one's meta-perception of preferential selection and POCA is moderated by initial self-efficacy), it was again necessary to conduct regression analyses. As shown in Table 13, the interaction term was not significant, meaning there is no support for Hypothesis 6.

Table 13

The Interactive Effect of MPPS[a] and Initial Self-Efficacy on POCA[b]

Step	Independent variable	B	Standard Error	t-statistic	*p*	R^2	ΔR^2
1	MPPS	-.16	.053	-3.30	.001		
	Initial self-efficacy	.32	.048	5.14	.000	.23	
2	Interaction term	.08	.048	1.71	.090	.25	.02

Note: $df = 3$; sample size = 144; B = unstandardized beta weight; α = significance level; R^2 = variance explained.

[a] MPPS is an abbreviation for "meta-perception of preferential selection" but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test" [b] POCA is an abbreviation for "perceptions of others' confidence in one's own ability"

In sum, there is only very limited support for the individual hypothesis tests. However, the overall model from which these hypotheses were derived is comprised of complex indirect effects that involve multiple variables and for this reason it makes sense to interpret my hypotheses within the context of the full path model (described below) to test the component path coefficients and overall model fit (Cohen & Cohen, 1983; Kline, 1998).

Model Test

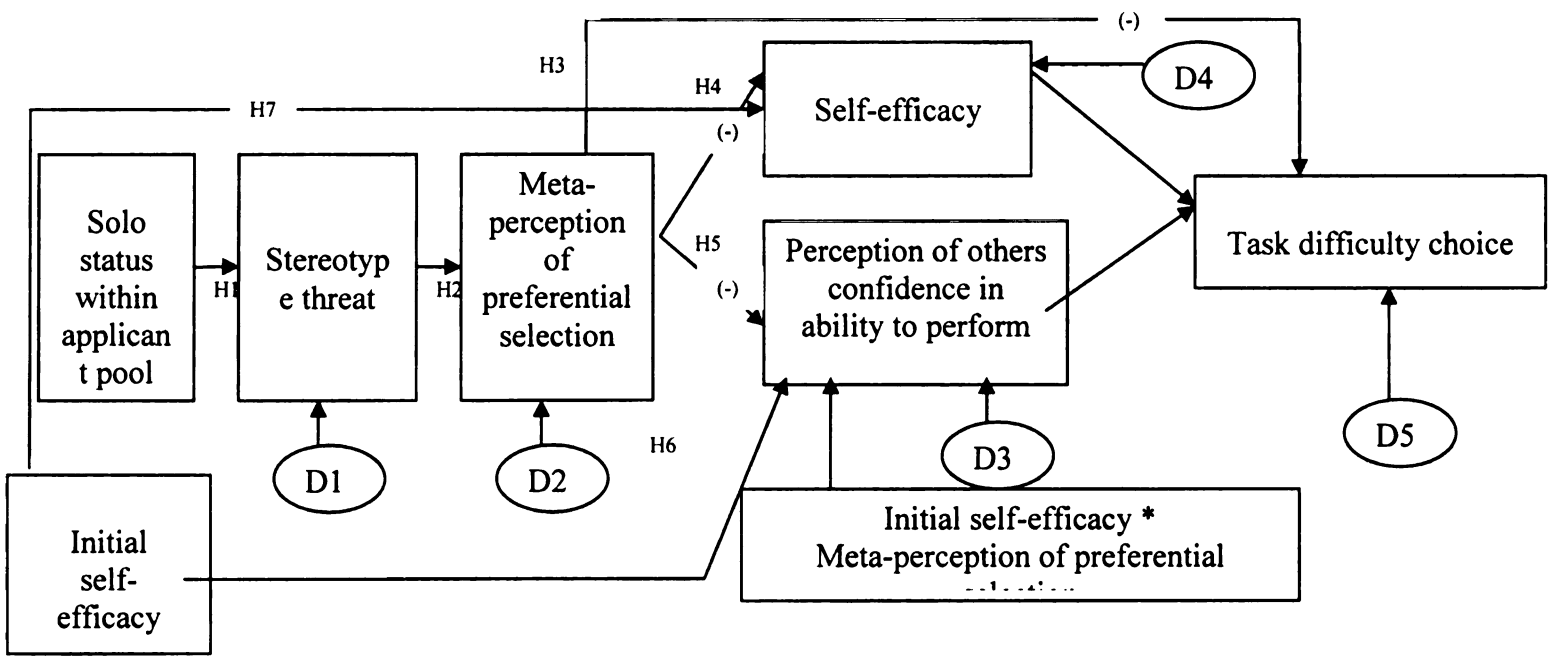
One of the benefits of a path analyses is that it allows a complete and simultaneous test of all relationships in the model. This is particularly useful in the present case, where I have hypothesized complex indirect effects with multiple variables. Path analysis is a means of testing structural models with observed variables only, which is why I first assessed the quality of my measures by conducting factor analyses (when relevant) and reliability estimates.

Any structural equation modeling (SEM) technique, which includes path analysis, involves six basic steps (Kline, 1998, p. 48-50). The first step was to specify the model. I

replicated the basic model (see Figure 4) across the seven cognitions, affect, and behavior variables (i.e., task difficulty choice, feedback-seeking, performance on the work sample, positive aroused affect, negative aroused affect). For example, I tested the effect of solo status on task-difficulty choice using the path model shown in Figure 7. Similar path models were generated for the remaining variables. It is important to note the redundancy in this approach (because the "back half" of the models is the same).

The model was comprised of three exogenous variables and five endogenous ones. In SEM, the term exogenous variable is used instead of "predictor" or "independent" variable and refers to variables that do not have hypothesized causes. Endogenous variables, on the other hand, are represented as the effects of other variables in the model. In this way, endogenous variables are similar to a dependent variable or a criterion but are represented as causes of other endogenous variables (Kline, 1998, p. 16). In the present case, the exogenous variables were the experimental manipulation (solo status), participants' initial self-efficacy, and the interaction term (initial self-efficacy × meta-perception of preferential selection). (While I am including an interaction term in the model, it should be noted that such continuous-variable interactions can be problematic in SEM, as assumptions are made regarding the appropriateness of reliability estimates and the presence of multivariate normality that are often violated by using a product term; e.g., see Mossbruger, Schermelleh-Engel, & Klein, 1997) The five endogenous variables were stereotype threat, the meta-perception of preferential selection, participants' self-efficacy, participants' POCA, and task difficulty choice. Each of these five endogenous variables has an error term, which is called a disturbance and is represented here with an uppercase D. Disturbance terms represent variance in an

Figure 7. Sample structural model.



endogenous variable that is unaccounted for by the variables specified as their cause. The absence of a specified association between disturbances reflects the presumption of independence of unmeasured causes (a presumption that can later be verified when testing for model fit). This path model was recursive (as opposed to non-recursive) because its disturbances were uncorrelated and all its causal effects are unidirectional (Kline, 1998, p. 105).

The second step was to determine whether the model was identified. A model is identified if it is theoretically possible to derive a unique estimate of every model parameter (Kline, 1998, p. 49). A simple method for determining this was to make sure that the number of parameter estimates does not exceed the degrees of freedom. In the present case, I have 36 pieces of information ((8×9)/2). I will be estimating 18 parameters (10 paths, 3 variances, and 5 disturbances). Thus, my model is theoretically identified.

The third and fourth steps involve data collection and analysis. Specifically, the third step involves selecting measures of the variables represented in the model and collecting the data, the details of which is described above. The fourth step was to analyze the model, which I did using AMOS 4.01 (Arbuckle & Wothke, 1999).

The fifth step was to evaluate model fit. All decisions about model fit were made using the combined criteria suggested by Hu and Bentler (1999). They recommended two possible combination rules, the first of which is to reject the model when RMSEA > .06, and SRMR > .09. The second combination rule is to reject the model when TLI < .96, and SRMR > .09. Following these suggested rules, I report the Standardized Root Mean Residual (SRMR), the Root Mean Square Error of Approximation (RMSEA), and the Tucker-Lewis Index (TLI) as indices of fit throughout this paper. Additionally, I report

and interpret the chi-square (χ^2) index. As shown in Table 14, the initial fit for each model was moderate to poor. Specifically, the average SRMR was .10 (*SD* = .004), the average RMSEA was .12 (*SD* = .01), the average TLI was .69 (*SD* = .03), and the average χ^2 was 56.34 (*SD* = 5.07). Neither of the combination rules was satisfied, and all of the χ^2 indices were significant. Since the data did not fit the model well, the sixth step was to respecify it.

Table 14

Initial Fit Statistics by Dependent Variable (N = 146)

	SRMR	RMSEA	TLI	χ^2	*df*	*p*
Task difficulty choice	.100	.112	.737	50.541	18	.000
Feedback-seeking	.100	.126	.691	59.575	18	.000
Performance on work sample	.097	.112	.724	50.655	18	.000
Positive aroused affect	.101	.118	.703	54.336	18	.000
Negative aroused affect	.107	.128	.659	60.781	18	.000

Note. SRMR = Standardized root mean residual; RMSEA = Root mean square of approximation; TLI = Tucker-Lewis Index; CHI = Chi-square index; DF = degrees of freedom; *p* = Significance of the chi-square test.

Respecifications Decision Points Common to All Models

Three types of respecification steps were common across models. First, based on the modification indices (which approximate the amount by which the model's overall χ^2 would decrease if a particular parameter were freely estimated; Kline, 1998, p. 134) and the fact that multiple variables were self-report data, I allowed a portion of the error terms to covary for all models. I allowed the error terms on self-efficacy and POCA to covary for all the models, and I allowed the error terms on the dependent variable and stereotype threat to covary for the models with negative aroused affect and feedback-seeking as the dependent variables. Chi-square difference tests indicated that the fit for this second iteration of models was significantly better. As shown in Table 15, overall fit was

Table 15

Fit Statistics For Second Iteration Of Models By Dependent Variable

	SRMR	RMSEA	TLI	χ^2	DF	*p*
Task difficulty choice	.091	.071	.895	29.282	17	.031
Feedback-seeking	.086	.082	.870	31.483	16	.011
Performance on work sample	.088	.071	.889	29.396	17	.031
Positive aroused affect	.092	.081	.861	33.077	17	.011
Negative aroused affect	.087	.065	.913	25.668	16	.061

Note. N = 146; SRMR = Standardized root mean residual; RMSEA = Root mean square of approximation; TLI = Tucker-Lewis Index; CHI = Chi-square index; DF = degrees of freedom; p = Significance of the chi-square test.

moderate. The average SRMR was .09 (*SD* = .002), the average RMSEA was .07 (*SD* = .006), the average TLI was .88 (*SD* = .02), and the average χ^2 was 29.87 (*SD* = 2.44). Although the χ^2 difference tests indicated that the second iteration of models fit significantly better than the original models, neither of the combination rules was satisfied, and all of the χ^2 indices were significant (except for the one for negative aroused affect, which was marginally significant).

The second respecification decision was with respect to stereotype threat. Across all models, the relationship between solo status and stereotype thread was non-significant, as was the relationship between stereotype threat and the meta-perception of preferential selection. Further, the modification indices suggested that an indirect effect be added from solo status to the meta perception of preferential selection. Together, this indicates that the data do not support the hypothesized inclusion of stereotype threat as a

mediator. Therefore, models that did not include stereotype threat were compared against the models that did include stereotype threat. A $\chi 2$ difference test was not appropriate here (because the models were not nested), but, as shown in Table 16, the fit for this third iteration of models improved and was moderate to good. Specifically, the average SRMR was .072 (SD = .004), the average RMSEA was .054 (SD = .013), the average TLI was .95 (SD = .022), and the average $\chi 2$ was 15.704 (SD = 2.253). Moreover, the revised models all had non-significant chi-square tests and they satisfied at least one of the two combination rules (Hu & Bentler, 1999) for three of the five dependent variables (task difficulty choice, performance on work sample, and negative aroused affect). The final models (and their further respecifications) are described in the next section.

Table 16

Fit Statistics For Third Iteration Of Models By Dependent Variable

	SRMR	RMSEA	TLI	χ^2	DF	*p*
Task difficulty choice	.069	.041	.972	13.669	11	0.252
Feedback-seeking	.071	.064	.937	17.445	11	0.095
Performance on work sample	.071	.054	.950	14.689	11	0.153
Positive aroused affect	.078	.073	.912	19.456	11	0.053
Negative aroused affect	.068	.035	.978	12.998	11	0.293

Note. N = 146; SRMR = Standardized root mean residual; RMSEA = Root mean square of approximation; TLI = Tucker-Lewis Index; CHI = Chi-square index; DF = degrees of freedom; p = Significance of the chi-square test.

Third, the initial self-efficacy × meta-perception of preferential selection interaction term was marginally significant (p = .055) for all of the subsequently discussed models. This interaction term was retained because (a) the models do not fit

better with it removed, and (b) it is consistent with the hypothesized model. Any interpretations made regarding this variable are necessarily tenuous, however it is theoretically interesting because it suggests that one's initial self-efficacy may buffer the negative effects of the meta-perception of preferential selection on POCA.

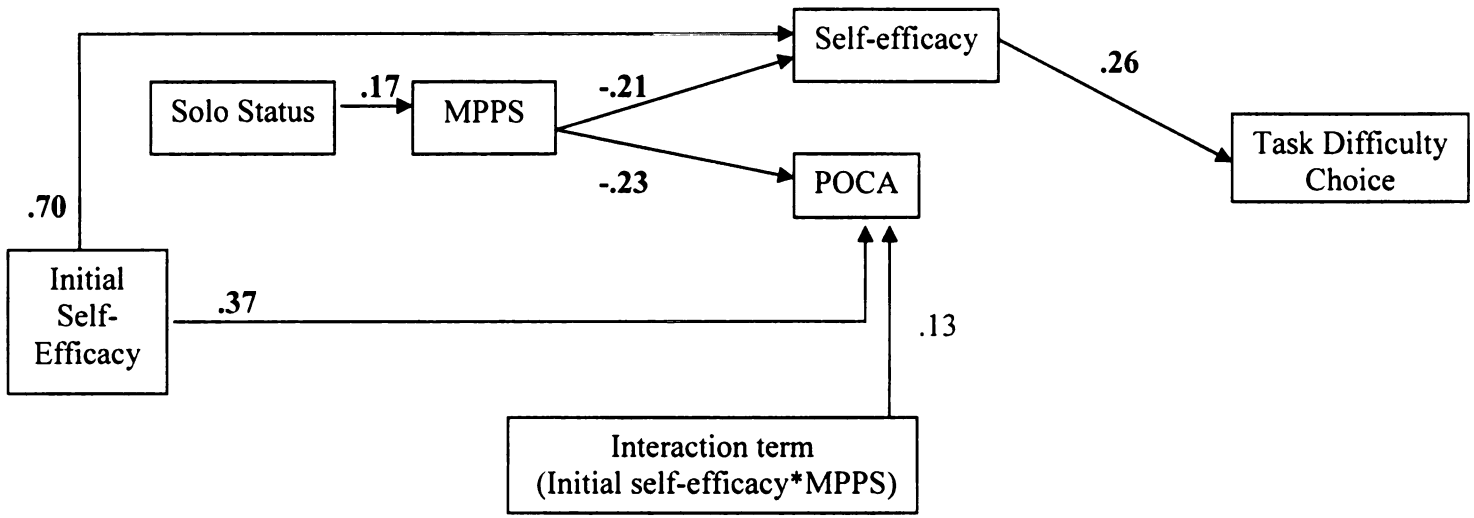
Unique Respecifications by Dependent Variable

Task difficulty choice. In the third iteration of the model for task difficulty choice, the paths from POCA and from the meta-perception of preferential selection to task difficulty choice were not significant. Additionally, in testing a model with these path removed, a chi square difference test indicated that model fit was not significantly worse $\Delta\chi^2$ (2) = 2.02, $p > .05$. Hence, the more parsimonious model (i.e., the one without the path) was adopted (see Figure 8). This model has good fit, $\chi^2(13) = 15.689$, $p > .05$; SRMR = .0725; RMSEA = .038; TLI = .976, but all indirect effects are non-significant. Thus, these results suggest that bearing solo status within an applicant pool affects task difficulty choice through its effect on the meta-perception of preferential selection and self-efficacy and that it affects POCA through its effect on the meta-perception of preferential selection.

Feedback-seeking. In the third iteration of the model for feedback-seeking, the paths from POCA and from self-efficacy to feedback seeking were non-significant. First I removed the path from self-efficacy to feedback-seeking. A χ^2 difference test suggested that model fit was not significantly worse with this path removed, $\Delta\chi^2$ (2) = .31, $p > .05$, and thus the more parsimonious model was adopted. In this new model, the path from POCA to feedback-seeking was marginally significant (rather than non-significant). However, a χ^2 difference test indicated that model fit was not significantly worse with

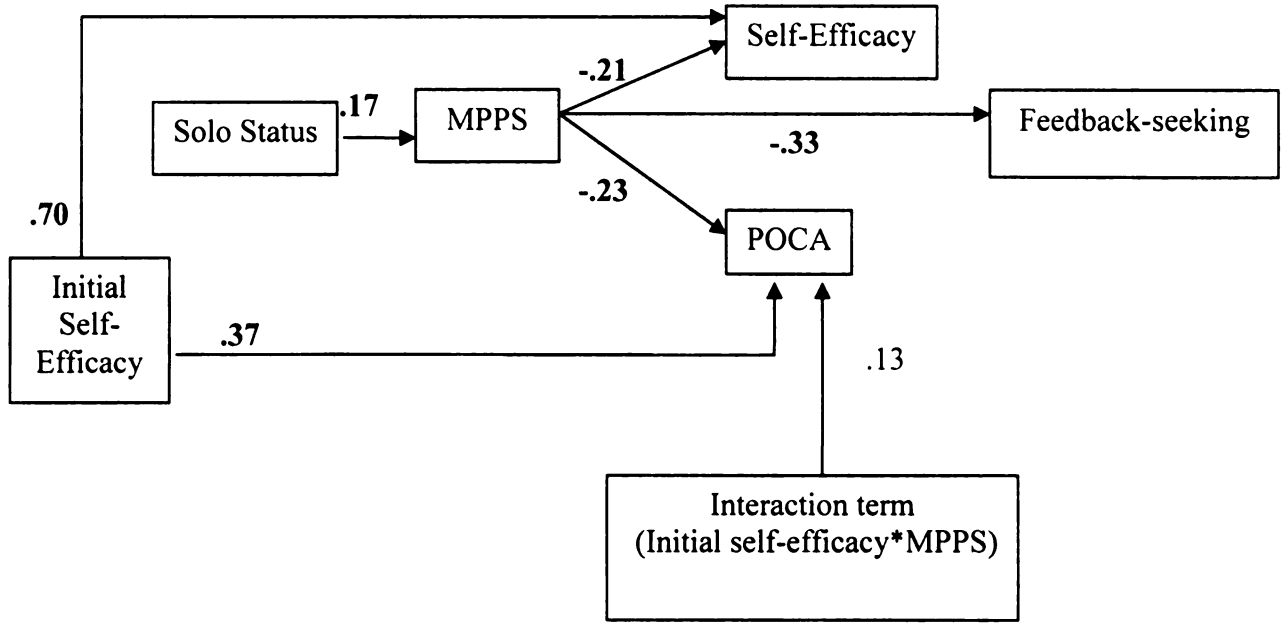
this path removed, $\Delta\chi^2$ (1) = 2.76, $p > .05$, and thus the more parsimonious model was adopted (see Figure 9). This model satisfies one of the combination rules and has moderate fit, χ^2 = 17.752, $p > .05$; SRMR = .076; RMSEA = .063; TLI = .938, but all indirect effects are non-significant. Thus, these results suggest that bearing solo status within an applicant pool affects feedback-seeking, self-efficacy, and POCA through its effect on the meta-perception of preferential selection.

Figure 8. Final path model for task difficulty choice (with standardized regression weights).



Note. All coefficients are significant ($p < .05$) except for the interaction term, which is marginally significant ($p < .10$). MPPS = Meta-perception of preferential selection but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test"; POCA = Perception of others' confidence in ability.

Figure 9. Final path model for feedback-seeking (with standardized regression weights).



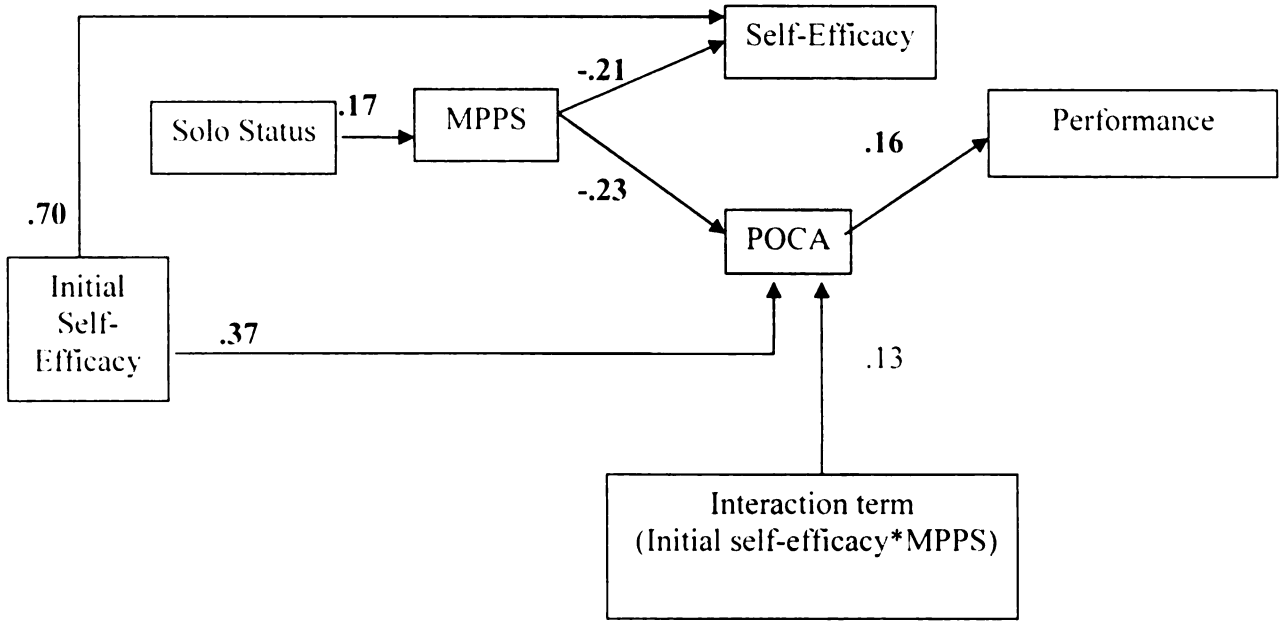
Note. All coefficients are significant ($p < .05$) except for the interaction term, which is marginally significant ($p < .10$). MPPS = Meta-perception of preferential selection but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test"; POCA = Perception of others' confidence in ability; ISE*MPPS = Interaction term.

Work sample performance. In the third iteration of the model for work sample performance, three paths to the dependent variable were not significant. Specifically, this was true for the ones from the meta-perception of preferential selection, from self-efficacy, and from POCA. Based on a series of χ^2 difference tests and observed changes in path significances, I retained the path to the dependent variable from POCA and removed the paths from the meta-perception of preferential selection and from self-efficacy. A χ^2 difference test indicated that model fit was not significantly worse, $\Delta\chi^2$ (2) = 1.16, $p > .05$. Thus, the more parsimonious model was adopted (see Figure 10), which has good fit, $\chi^2 = 15.846$, $p > .05$; SRMR = .071; RMSEA = .039; TLI = .975.

Next, I ran a model where I controlled for the effect of cognitive ability (assessed via the selection test) on initial self-efficacy and on work sample performance. Model fit was still good, $\chi^2 = 23.056$, $p > .05$; SRMR = .0745; RMSEA = .044; TLI = .959, but the link between POCA and work sample performance became non-significant. Additionally, all indirect effects are non-significant Thus, these results suggest that bearing solo status within an applicant pool may affect performance through its effects on the meta-perception of preferential selection and POCA, although these effects may become insignificant once cognitive ability is accounted for. They also suggest that solo status affects self-efficacy through its effect on the meta-perception of preferential selection.

Model fit was moderate, $\chi^2 = 21.406$, $p > .05$; SRMR = .082; RMSEA = .067; TLI = .924. Thus, these results suggest that bearing solo status within an applicant pool affects positive aroused affect through its effect on the meta-perception of preferential selection and on self-efficacy. They also suggest solo status affects POCA through its effect on the meta-perception of preferential selection.

Figure 10. Final path model for job performance (with standardized regression weights).

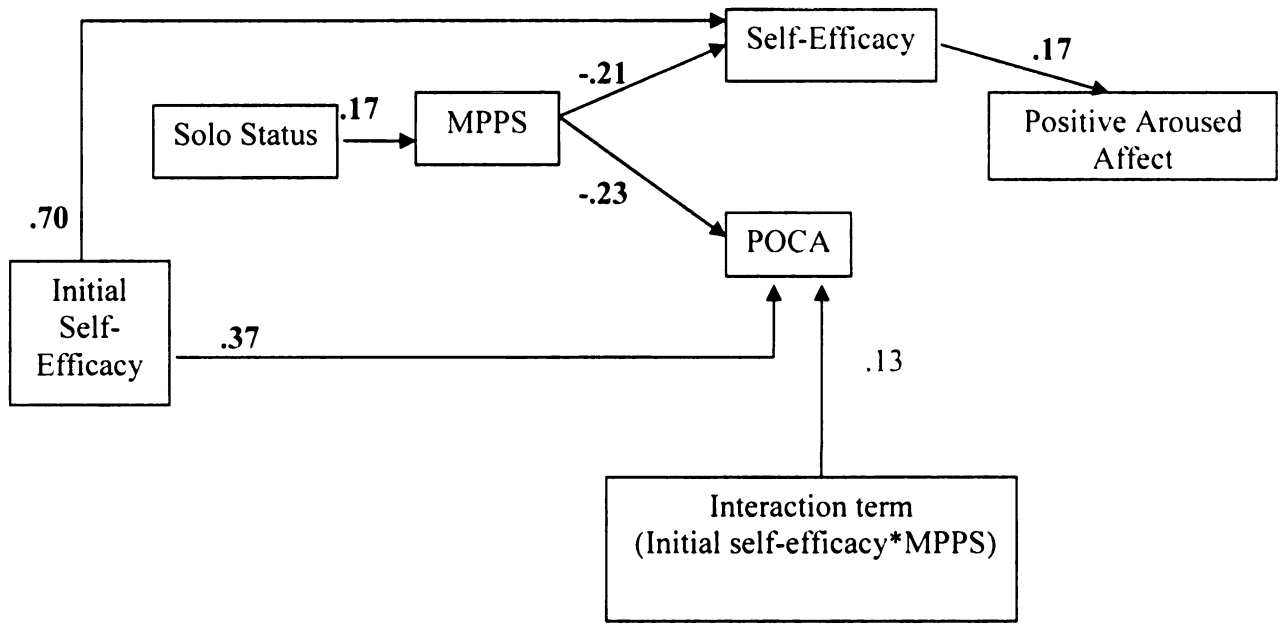


Note. All coefficients are significant ($p < .05$) except for the interaction term, which is marginally significant ($p < .10$). POCA = Perception of others' confidence in ability to perform. MPPS = Meta-perception of preferential selection but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test."

Positive aroused affect. In the third iteration of the model for positive aroused affect, three paths to the dependent variable were not significant. Specifically, this was true for the ones from the meta-perception of preferential selection, from self-efficacy, and from POCA. Based on a series of χ^2 difference tests and observed changes in path significances, I retained the path to the dependent variable from self-efficacy and removed the paths from the meta-perception of preferential selection and from POCA. A χ^2 difference test indicated that model fit was not significantly worse, $\Delta\chi^2$ (2) = 2.05, $p >$ .05. Thus, the more parsimonious model was adopted (see Figure 11). Again, note that all indirect effects are non-significant

Negative aroused affect. The results of this path analyses did not provide support for the model with negative aroused affect for a dependent variable. The third iteration of the model for negative aroused affect had moderate fit, but, despite various iterations, key paths (e.g., the links between the two mediators and the relevant dependent variable) were non-significant.

Figure 11. Final path model for positive aroused affect (with standardized regression weights).



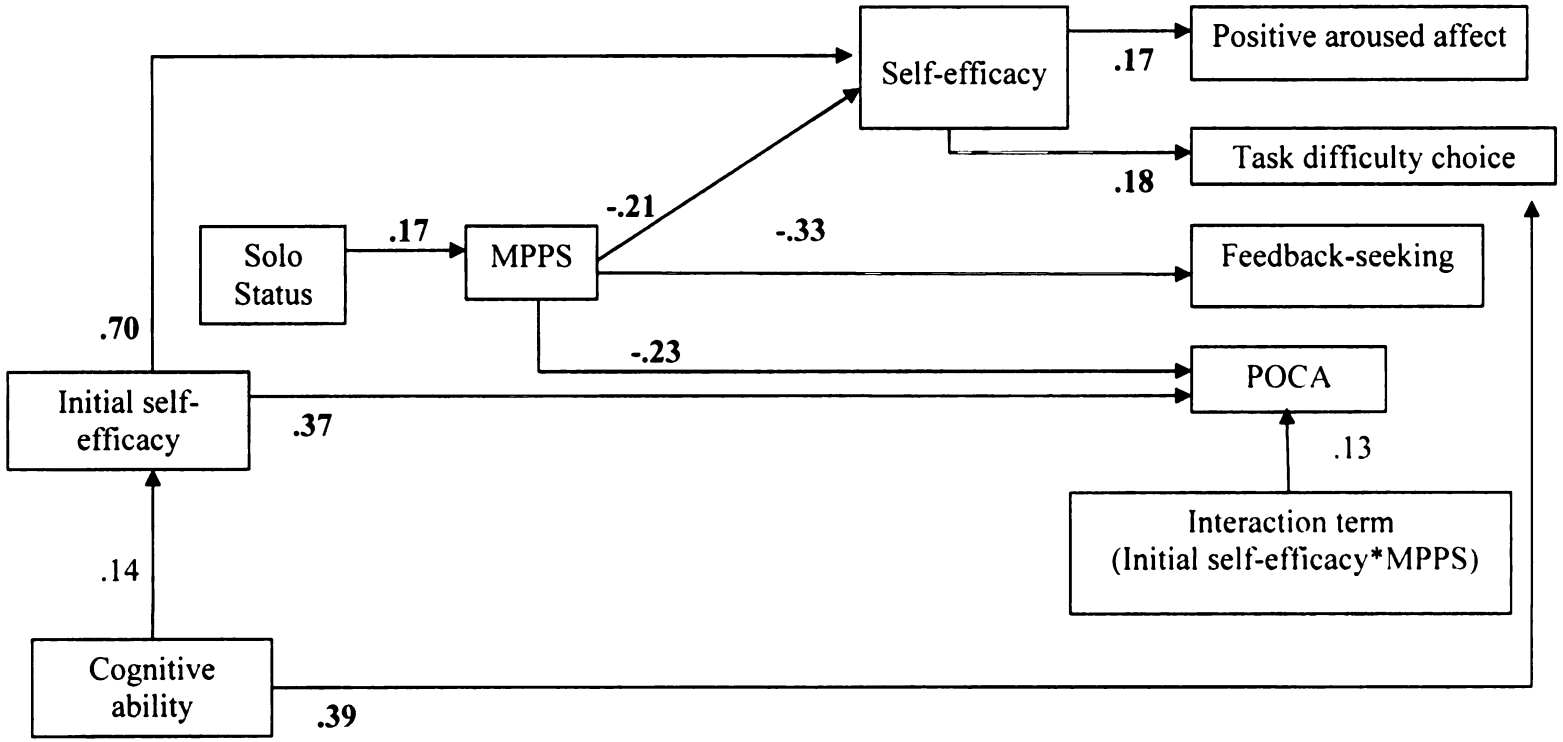
Note. All coefficients are significant ($p < .05$) except for the interaction term, which is marginally significant ($p < .10$); POCA= Perception of others' confidence in one's own ability to perform; ISE*MPPS = Interaction term; MPPS = Meta-perception of preferential selection but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test."

Follow-up Analyses

The results described thus far suggest that solo status may individually affect four dependent variables: task difficulty choice, feedback-seeking, work sample performance, and positive aroused affect. For ease of interpretation, I created an overall model that incorporated each of the four aforementioned dependent variables in which I controlled for the effects of cognitive ability on initial self-efficacy and on task difficulty choice. As before, the relationship between POCA and performance on the work sample fell out once cognitive ability was controlled for and the interaction term was only marginally significant (p = .055). The final overall model (shown in Figure 12) had moderate to good fit, χ^2 = 45.482, p > .05; SRMR = .0863; RMSEA = .053; TLI = .924, although all indirect effects are non-significant. It satisfied one of the combination rules and has a non-significant χ^2 index. This model is used guide the discussion that follows.

This overall, post hoc model suggests differential pathways through which bearing solo status within an applicant pool may influence the positive aroused affect, task difficulty choice, feedback seeking, and POCA (i.e., perceptions of others' belief in one's capability to perform) of newly hired females. Specifically, solo status negatively relates to the first two variables through its effect on the meta-perception of preferential selection and to the second two variables through this as well as self-efficacy. This post hoc model also suggests that one's initial self-efficacy *may* buffer the negative effects of the meta-perception of preferential selection on POCA, although one must interpret the marginally significant interaction term with caution.

Figure 12. Overall path model (with standardized regression weights).



Note. All coefficients are significant ($p < .05$) except for the interaction term, which is marginally significant ($p < .10$), and the path from cognitive ability to initial self-efficacy, which is non-significant ($p > .05$). MPPS = Meta-perception of preferential selection but due to a programming error is more accurately described as "the belief that one was not selected on the basis of the selection test";; POCA = Perception of others' confidence in one's own ability to perform.

DISCUSSION

The objective of the present study was to draw from three streams of research (i.e., on solo status, stereotype threat, and preferential selection) to generate a testable model of the relationship between bearing solo status within an applicant pool and newly hired females' cognitions, affect, and behavior. Such a model was developed and then tested via regression-based individual hypothesis tests and path analyses. Regression results provided little to no support for major hypotheses and path analyses yielded moderate to poor fit statistics for initial models (see Table 14). Model respecification yielded models for task difficulty choice, feedback-seeking, performance, and positive aroused affect (see Figures 7 – 10). Models had moderate to good fit, although response-response issues are likely to have played a role in the path coefficients that were the highest. Moreover, the significant results are likely because the redundant analyses capitalize on chance. Thus, it is very important that the reader interpret these results with caution. The overall, post hoc model (shown in Figure 12) had moderate to good fit ($\chi 2$ = 45.482, $p > .05$; SRMR = .0863; RMSEA = .053; TLI = .924) and will be used to guide the present discussion.

Key Findings

First, bearing solo status in a selection context (i.e., within an applicant pool) prompts one to develop the meta-perception of preferential selection. The results of Heilman and Blader (2001; see also Heilman, 1980) suggest that co-workers assume females bearing solo status to be preferentially selected, and the results of the present study suggest that the solos themselves are aware of this. Notably, Heilman and Blader

manipulated solo status within a newly hired cohort, while the present study did so within an applicant pool, suggesting that the link between solo status and preferential selection occurs in the minds of different people across different types of selection contexts. The central issue underlying this link likely concerns the "stigma of incompetence" hypothesized to be associated with those who are (or are assumed to be) beneficiaries of affirmative action (e.g., Heilman & Haynes, in press). Based on the results of Heilman et al., such a stigma appears to "tar" salient minorities and prompt thoughts of preferential selection in the minds of themselves and others. The present study found some support for this for women with respect to the meta-perception of preferential selection.

Second, the meta-perception of preferential selection (which, due to a programming error, more accurately refers to "the belief that one was not selected on the basis of selection test") negatively related to important variables: self-efficacy, POCA (i.e., one's perception of others' confidence in one's ability to perform), positive aroused affect, task difficulty choice, and feedback-seeking. This general pattern of findings is consistent with that of Heilman and Alcott (2001), who manipulated the meta-perception of preferential selection and found it to negatively relate to inferred competence expectations, ensuing task decisions, self-regard, and the favorability of affective reactions. The results of the present study extend the known scope of impact to include feedback-seeking, and also suggest differential paths by which the effects of the meta-perception of preferential selection occur (see Figures 7-11).

Third, high initial self-efficacy *may* help foster some "resilient" reactions to the meta-perception of preferential selection. Specifically, there was a marginally significant ($p = .055$) interaction between initial self-efficacy and the meta-perception of preferential

selection on POCA, such that individuals with high initial self-efficacy experienced a less negative impact on POCA (vs. those with low initial self-efficacy). However, this "buffering" effect in the present study did not translate into other positive effects, as POCA did not uniquely relate to any of the outcomes examined (see Figures 7-11).

Unexpected Findings

First, there was no significant relationship between solo status and stereotype threat, and all models yielded higher fit statistics without the presence of the stereotype threat variable. Roberson et al. (2003) found a link between these two variables and Stangor et al. (1998) assumed one was present, so its absence in the results of the present study is surprising. The explanation likely lies in the measure of stereotype threat, the quality of which can be improved in future research, and the timing of this measurement, which was at the end of the study rather than at the point at which the threat was hypothesized to occur. To reduce common method bias and the risk of alerting participants to the nature of the study, it would be helpful if future self-report measures of the construct were phrased less directly and/or if different (e.g., observational) methods were developed.

Second, there was no significant relationship between POCA and the outcome variables of interest (e.g., task difficulty choice, feedback-seeking, etc.). This absence is unexpected because the proposed link is well-supported by the literature. In fact, each stream of research reviewed here (i.e., on solo status, stereotype threat, and preferential selection) suggested, in one form or another, that people's perception of others' evaluation of them would play a mediating role in the relationship between solo status and the cognitions, affect, and behavior of the solos themselves. Moreover, this is

consistent with the literatures on self-fulfilling prophecies (Merton, 1948) and, related, on the Pygmalion effect (Eden, 2003). The most likely explanation for this lies in the measure of POCA, a point to which I return to later.

Third, there was no significant relationship between self-efficacy and performance, which is unexpected because these two variables have been shown repeatedly to be associated with one another (Stajkovic & Luthans, 1998). The simplest explanation for its absence is range restriction, since approximately half of the participants scored a zero on the performance measure. This floor effect of the performance measure is discussed in the next section.

Study Limitations

The strengths and weaknesses of laboratory experiments have been discussed elsewhere (e.g., Kerlinger, 1992, pp. 367-369) and will not be repeated here. However, the artificiality of any experimental research situation (including this one) is certainly worth noting as well as the related lack of external validity. Moreover, the construct validity of some of the measures used is questionable (e.g., POCA, Stereotype Threat), a point to which I return when highlighting directions for future research. Here, I describe three key problems with the present study as well as their implications for interpreting its results.

First, it is unclear whether participants perceived the job to be "masculine." A measure of this would have been helpful in interpreting the non-significant link between solo status and stereotype threat ($r = -.06$, $p > .05$), because, for example, I could examine whether the perceived masculinity acts as a moderator. As shown in Table 17, participants do report being aware of stereotypes about women having less ability than

men in traditionally masculine jobs and they do also report believing that the managers who would be evaluating them were aware of such stereotypes. This coupled with evidence that management is associated with men (e.g., Powell et al., 2002) provides supports for the idea that study participants perceived the managerial internship to be at least a somewhat masculine job, but, without any data, this unfortunately remains an untested assumption. If it is a false one, this may explain the small magnitude (Cohen, 1988) of the bivariate correlations that include solo status (see Table 11).

Table 17

Personal Awareness of and Perception of Managers' Awareness of Stereotype

Item	*n*	*M*	*SD*
1 - There is a stereotype about women having less ability than men in traditionally masculine jobs	144	4.10	.88
2 - There is a stereotype about women being less likely to succeed than men in traditionally masculine jobs	144	3.87	1.10
3 - Managers at this organization think there is a stereotype about Women having less ability than men in traditionally masculine jobs	145	3.39	1.08
4 - Managers at this organization think there is a stereotype about Women being less likely to succeed than men in traditionally masculine jobs	143	3.41	1.10

Note. All items were placed at the end of the study, began with phrase "Regardless of my personal beliefs..." and used a 5-point Likert scale where 1 = strongly disagree and 5 = strongly agree.

Second, the performance measure had a serious floor effect, and thus it is possible that participants' realization of their poor performance affected their response to

subsequent measures (e.g. affect, stereotype threat). One possible explanation for this floor effect is that the interface was somewhat clumsy, requiring that participants switch between multiple screens on their computer in order to complete the work sample. While this mimics how individuals manage many paper-and-pencil tasks, it may not have transferred well into an online format (see Appendix C). Another possible explanation is the relatively low ($10) incentive offered for high performance. Additionally, participants were informed that they would be mailed payment at a later date. These factors together – the low incentive, the interface, and the anticipated delay in receiving the incentive by mail at a later date, might not have sufficiently motivated participants.

Additionally, it is possible that the self-efficacy measure that preceded the task set unrealistically high performance expectations, making them particularly susceptible to experiencing frustration and withdrawing effort. The final item of the self-efficacy measure read, "I will be able to complete 16 schedules," a level of performance that is highly unlikely based on previous research (e.g., Carr, 2001; Q.M. Roberson et al., 1999) but perhaps became a goal for those who provided a response greater than or equal to "neutral" (approximately 40%). Currently, applied researchers measure confidence in one's ability to perform a task in a variety of ways (e.g., see Donovan & Williams, 2003; Phillips, Hollenbeck, & Ilgen, 1996; Schmidt et al., 2004). Perhaps a fruitful area of future research is to develop appropriately anchored measures of self-efficacy (see Kahneman, 2003; Schwarz, 1999).

Finally, I failed to record responses from the majority (92%) of respondents for one of the two items used to measure the meta-perception of preferential selection. This

limitation is significant because the one remaining item leaves open the question of reliability. Further, as noted throughout the manuscript, one could argue that the results of the present study do not suggest that solo status prompts the meta-perception of preferential selection but rather that it prompts the perception that the reason for hire is *anything* other than performance on the selection test. Future research with a more fully operational measure will help better understand the relationship between the meta-perception of preferential selection and the other variables of interest.

Directions for Future Research

Future examinations of solo status, stereotype threat, and preferential selection should focus less on the environmental condition of solo status, which has variable contexts (e.g., work group, applicant pool) and perspectives (e.g., co-workers, solos themselves), and more on the psychologically meaningful variables of salience, distinctiveness, and being "out of the ordinary" (Neimann & Dovidio, 1998; Heilman & Blader, 2001). Doing so would facilitate connection with other literatures, such as judgment-and-decision-making (e.g., Kahneman, 2003), organizational justice (e.g., van den Bos & Lind, 2002), and positive organizational scholarship (e.g., Cameron, Dutton, & Quinn, 2003), which among other things might help clarify potentially informative relationships amongst uncertainty, heuristic processing, stereotyping, identity, and the meaning of work.

Additionally, while there has been a burgeoning interest in constructs related to self-evaluation and others' evaluation of ourselves, these constructs and their associated measures need to be better validated before developing a theory that encompasses them. Such investigations might include more qualitative and observational methods of data

collection. The present study may best illustrate the need for this type of research, as the questionable construct validity of key measures (e.g., stereotype threat, POCA) as well the heavy reliance on self-report data made it difficult to disentangle common method bias and affective reactions from more meaningful relationships. Useful research to consult for such efforts may be that on social identity (Brewer, 1991; Tajfel & Turner, 1986) and on the self-protective, attributional and emotional response patterns associated with processing feedback (see Crocker & Major, 1989; Fridja, 1999; Weiner, Russell, & Lerman, 1978; see also Kluger & DeNisi, 1996; Ilgen & Davis, 2001).

Finally, future research on solo status, stereotype threat, and preferential selection would benefit from broadening the content and level of variables of interest to include those related to social capital – the existence of positive interpersonal relationships among individuals (Baker, 2000; Coleman, 1998). Much of the research reviewed here suggests the damaging effects of solo status are in part because of *others'* unfavorable reactions to the solo (perceived or feared). Perhaps the existence of just a few high quality connections (i.e., ones that are flexible, strong, and resilient; Dutton & Heaphy, 2003, p. 263) would ameliorate any negative effects of solo status. For example, such connections may open key channels of communication so that solos (as well as other non-solos) have access to power structures and system knowledge and create mechanisms for sponsorship and peer alliances (Kanter, 1977; Ragins, 1991). Given recent research suggesting that gender stereotypes can prompt bias in evaluative judgments of women even when these women have proved themselves to be successful and demonstrated their competence (Heilman, Wallen, Fuchs, & Tamkins, 2004), the cultivation of a few high

quality connections might facilitate success in nontraditional areas even if only by keeping others' evaluation in check.

Concluding Comment

The good news is that there are an increasing number of women who are gaining employment in jobs historically occupied by men (e.g., high status management positions; Federal Glass Ceiling Commission, 1995; Powell, et al, 2002). The bad new is that, in such cases, if these women are the only female in an otherwise male applicant pool, they may have the meta-perception of preferential selection. However, as steps are taken to ameliorate the perception of preferential selection and to support solos both in terms of personal growth and upward movement, hopefully the landscape will continue to change such that women and men are more equally distributed across high-status jobs (see Eagly & Steffen, 1984; Federal Glass Ceiling Commission, 1995; Powell & Graves, 2003).

Appendices

Appendix A

Measures

Self-efficacy

1. I will be able to complete 1 schedule.
2. I will be able to complete 2 schedules.
3. I will be able to complete 3 schedules.
4. I will be able to complete 4 schedules.
5. I will be able to complete 5 schedules.
6. I will be able to complete 6 schedules.
7. I will be able to complete 7 schedules.
8. I will be able to complete 8 schedules.
9. I will be able to complete 9 schedules.
10. I will be able to complete 10 schedules.
11. I will be able to complete 11 schedules.
12. I will be able to complete 12 schedules.
13. I will be able to complete 13 schedules.
14. I will be able to complete 14 schedules.
15. I will be able to complete 15 schedules.
16. I will be able to complete 16 schedules.

Perceived face validity of the selection test

1. The content of the selection test reflected the content of the job.
2. The actual content of the test clearly related to the job.
3. The content of the selection test seemed predictive of future performance on the job.
4. I am confident that the test predicts how well people will perform on the job.

Stereotype threat measure used by Roberson et al., 2003

1. Some people feel I have less ability to perform my job because of my race.
2. My job may be easier to perform for people of my race [Reverse-coded].
3. Other people expect me to perform poorly because of my race.
4. In my organization, people of my race often face biased evaluations.
5. My race does not affect people's perceptions of my ability to perform my job [Reverse-coded].

Stereotype threat measure used in the present study

1. This organization's managers will think I have less ability to perform this job because of my sex.
2. This organization's managers will think my job is easier for people of my sex to perform [Reverse-coded but dropped from analyses].
3. This organization's managers will expect me to perform poorly because of my sex.
4. People of my sex will face biased evaluations from this organization's managers.
5. My sex will not affect managers' perceptions of my ability to perform this job [Reverse-coded].

Appendix B

Attrition Analyses

I conducted two series of analyses in an attempt to determine whether participants' attrition was systematic. The first set compared participants who satisfactorily attempted to complete the full study (n = 171) with those who did not (n = 102). Independent samples t-tests were conducted on responses to demographics and major study variables on which data were collected from all participants. As shown in the table below, the participants who provided useable Phase Two data were significantly older (d = .31) and performed significantly better on the selection test (d = .53) than non-Phase Two respondents. Not shown in the table, the proportion of racial group membership did not significantly differ between the two samples for any of the minority subgroups (p's > .05, two-tailed). However, the proportion of whites in the phase two sample (86%) significantly differed from that proportion in the remainder (68%; $t(271) = -3.60$, $p <$ .001). An alternative expression of this is that fewer total minorities were included in the Phase Two sample than the non-Phase Two sample.

	Phase two sample			Non-phase two sample					
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*df*	*p*
Age	171	20.86	3.43	95	19.99	1.87	-2.30	264	.022
Solo	171	0.53	0.50	100	0.56	0.50	0.56	269	.578
Campus	171	1.54	0.50	102	1.55	0.50	0.29	271	.772
Initial self-efficacy	171	3.3	0.89	54	3.21	0.74	-0.68	223	.498
Selection test	165	18.16	6.35	39	14.7	6.79	-3.05	202	.003

The second set of analyses utilized only those participants who satisfactorily attempted to complete Phase Two of the study (n = 171). These analyses compared participants who were able to submit and proceed past their work sample with those who were not able to do so. Independent samples t-tests compared these two groups on self-efficacy, POCA (i.e., perceptions of others' confidence in one's own ability), and task difficulty choice in addition to the variables assessed in the first set of analyses. As shown in the table below, those who completed the work sample had selected a more difficult task than those who did not (d = .49). There were no significant differences in attrition by racial subgroups (p's > .05, two-tailed).

	Work sample			Remainder					
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*df*	*p*
Age	145	20.81	3.39	25	21.12	3.68	0.41	168	.681
Solo	145	0.53	0.50	25	0.52	0.51	-0.10	168	.919
Campus	145	1.52	0.50	25	1.60	0.50	0.70	168	.485
Initial self-efficacy	145	3.28	0.85	25	3.42	1.12	0.75	168	.455
Selection test	140	18.34	6.35	24	17.13	6.40	-0.87	162	.387
Self-efficacy	145	3.46	0.84	25	3.70	0.97	1.29	168	.200
POCA	145	3.91	0.56	25	4.02	0.53	0.90	168	.368
Task difficulty	145	1.81	0.67	24	1.50	0.59	-2.17	167	.031

Appendix C

Detailed Description of the Task

The communication and technology organization is interested in investigating the quality and reliability of their suppliers. For this reason, they want you to develop as many unique inventory schedules as possible, with each schedule containing five different suppliers within the same month.

Instructions
Here is a link to your twelve suppliers and their possible inventory times (each with a different code) [See below]. Also, note the following schedule constraints:

1. A completed inventory schedule will include the Supplier Code and the Inventory Time Code
2. Each inventory schedule must have 5 different suppliers schedule in the same month
3. Each inventory schedule must be unique -- that is., it cannot duplicate another inventory schedule.
4. Three of the suppliers have dual locations (Dallas/Irving, Los Angeles/El Segundo, Tampa/Ybor City). When you order from one of these suppliers, you must list both locations and you must list them separately.

Example of a correct schedule

SUPPLIER NAME	SUPPLIER CODE	INVENTORY TIME	INVENTORY TIME CODE
Birmingham	BIR	April 1-4	A
Atlanta	ATL	April 8-13	B
Tampa: Ybor City	TAM-Y	April 16-18	L
Tampa	TAM	April 20-24	D
Seattle	SEA	April 29-30	J

- The schedule contains the Supplier Code and the Inventory Time Code
- This schedule contains non-overlapping dates.
- The schedule has 5 different suppliers in the same month
- This schedule contains an order from one of the suppliers with dual locations (Tampa/Ybor City) and therefore correctly lists both of these suppliers and lists them separately.

Examples of incorrect schedules

SUPPLIER NAME	SUPPLIER CODE	INVENTORY TIME	INVENTORY TIME CODE
Birmingham	BIR	April 1-4	A
Boston	***BOS***	***April 1-2***	***A***
Atlanta	ATL	April 8-14	B
Tampa: Ybor City	TAM-Y	April 16-18	L
Tampa	TAM	April 20-24	D

- The schedule contains the Supplier Code and the Inventory Time Code
- ***This schedule does not contain non-overlapping dates.***
- The schedule has 5 different suppliers in the same month
- This schedule contains an order from one of the suppliers with dual locations (Tampa/Ybor City) and therefore correctly lists both of these suppliers and lists them separately.

SUPPLIER NAME	SUPPLIER CODE	INVENTORY TIME	INVENTORY TIME CODE
Birmingham	BIR	April 1-4	A
Birmingham	***BIR***	***April 10-13***	***C***
Tampa: Ybor City	TAM-Y	April 16-18	L
Tampa	TAM	April 20-24	D
Seattle	SEA	April 29-30	J

- The schedule contains the Supplier Code and the Inventory Time Code
- This schedule contains non-overlapping dates.
- ***The schedule DOES NOT HAVE 5 different suppliers in the same month***
- This schedule contains an order from one of the suppliers with dual locations (Tampa/Ybor City) and therefore correctly lists both of these suppliers and lists them separately.

SUPPLIER NAME	SUPPLIER CODE	INVENTORY TIME	INVENTORY TIME CODE
Birmingham	***BIR***	***June 1-4***	***A***
Atlanta	ATL	April 8-13	B
Tampa: Ybor City	TAM-Y	April 16-18	L
Tampa	TAM	April 20-24	D
Seattle	SEA	April 29-30	J

- The schedule contains the Supplier Code and the Inventory Time Code
- This schedule contains non-overlapping dates.
- ***The schedule DOES NOT HAVE 5 different suppliers in the same month***
- This schedule contains an order from one of the suppliers with dual locations (Tampa/Ybor City) and therefore correctly lists both of these suppliers and lists them separately.

SUPPLIER NAME	SUPPLIER CODE	INVENTORY TIME	INVENTORY TIME CODE
Birmingham	BIR	April 1-4	A
Atlanta	ATL	April 8-13	B
Boston	BOS	April 16-18	F
Tampa	TAM	April 20-24	D
Seattle	SEA	April 29-30	J

- The schedule contains the Supplier Code and the Inventory Time Code
- This schedule contains non-overlapping dates.
- The schedule has 5 different suppliers in the same month
- ***This schedule contains an order from one of the suppliers with dual locations (Tampa/Ybor City) and therefore INCORRECTLY lists only ONE of these suppliers.***

CODING INFORMATION

SUPPLIER LOCATION	SUPPLIER CODE	TIME (MONTH)	TIME (DATE)	TIME CODE
Atlanta	ATL	APR or JUN	8-13	B
Atlanta	ATL	APR or JUN	16-21	C
Atlanta	ATL	APR or JUN	22-27	D
Atlanta	ATL	MAY or JUL	1-6	E
Atlanta	ATL	MAY or JUL	8-13	F
Atlanta	ATL	MAY or JUL	14-20	G
Atlanta	ATL	MAY or JUL	20-26	H
Atlanta	ATL	AUG	1-11	I
Atlanta	ATL	AUG	12-13	J
Birmingham	BIR	APR or JUN	1-4	A
Birmingham	BIR	APR or JUN	5-8	B
Birmingham	BIR	APR or JUN	10-13	C
Birmingham	BIR	MAY	20-24	I
Birmingham	BIR	MAY	25-28	J
Birmingham	BIR	MAY or JUL	1-4	E
Birmingham	BIR	MAY or JUL	5-8	F
Birmingham	BIR	MAY or JUL	10-13	G
Birmingham	BIR	MAY or JUL	16-20	H
Boston	BOS	APR, JUN, or AUG	1-2	A
Boston	BOS	APR, JUN, or AUG	3-6	B
Boston	BOS	APR, JUN, or AUG	7-8	C
Boston	BOS	APR, JUN, or AUG	10-11	D
Boston	BOS	APR, JUN, or AUG	12-15	E
Boston	BOS	APR, JUN, or AUG	16-18	F
Boston	BOS	APR, JUN, or AUG	19-21	G
Boston	BOS	APR, JUN, or AUG	22-24	H
Boston	BOS	APR, JUN, or AUG	25-27	I
Boston	BOS	JUN	29-30	J
Chicago	CHI	APR, JUN, or AUG	1-2	A
Chicago	CHI	APR, JUN, or AUG	3-6	B
Chicago	CHI	APR, JUN, or AUG	7-8	C
Chicago	CHI	APR, JUN, or AUG	10-11	D
Chicago	CHI	APR, JUN, or AUG	12-15	E
Chicago	CHI	APR, JUN, or AUG	16-18	F
Chicago	CHI	APR, JUN, or AUG	19-21	G
Chicago	CHI	APR, JUN, or AUG	22-24	H
Chicago	CHI	APR, JUN, or AUG	25-27	I
Chicago	CHI	JUN	29-30	J
Dallas	DAL	APR or JUN	5-8	B
Dallas	DAL	APR or JUN	10-13	C
Dallas	DAL	APR or JUN	14-18	D

Dallas	DAL	APR or JUN	19-23	E
Dallas	DAL	APR or JUN	24-27	F
Dallas	DAL	MAY or JUL	5-8	G
Dallas	DAL	MAY or JUL	10-13	H
Dallas	DAL	MAY or JUL	14-18	I
Dallas	DAL	MAY or JUL	19-23	J
Dallas: Irving	DAL-I	JUN	3-6	K
Dallas: Irving	DAL-I	JUN	16-18	L
Dallas: Irving	DAL-I	JUL	3-6	M
Dallas: Irving	DAL-I	JUL	16-18	N
Detroit	DET	APR, JUN, or AUG	1-2	A
Detroit	DET	APR, JUN, or AUG	3-6	B
Detroit	DET	APR, JUN, or AUG	7-8	C
Detroit	DET	APR, JUN, or AUG	10-11	D
Detroit	DET	APR, JUN, or AUG	12-15	E
Detroit	DET	APR, JUN, or AUG	16-18	F
Detroit	DET	APR, JUN, or AUG	22-24	G
Detroit	DET	APR, JUN, or AUG	25-27	H
Detroit	DET	APR, JUN, or AUG	28-29	I
Detroit	DET	JUL	29-30	J
Kansas City	KAN	APR or JUN	1-4	A
Kansas City	KAN	APR or JUN	5-8	B
Kansas City	KAN	APR or JUN	10-13	C
Kansas City	KAN	APR or JUN	14-18	D
Kansas City	KAN	APR or JUN	19-23	E
Kansas City	KAN	MAY or JUL	1-4	F
Kansas City	KAN	MAY or JUL	5-8	G
Kansas City	KAN	MAY or JUL	10-13	H
Kansas City	KAN	MAY or JUL	14-18	I
Kansas City	KAN	MAY or JUL	19-23	J
Los Angeles	LOS	APR	1-6	A
Los Angeles	LOS	MAY	16-21	B
Los Angeles	LOS	JUN	1-6	C
Los Angeles	LOS	JUL	16-21	D
Los Angeles	LOS	AUG	1-6	F
Los Angeles: El Segundo	LOS-E	APR	3-6	G
Los Angeles: El Segundo	LOS-E	APR	7-8	H
Los Angeles: El Segundo	LOS-E	MAY	1-2	K
Los Angeles: El Segundo	LOS-E	MAY	3-6	L
Los Angeles: El Segundo	LOS-E	JUN	7-8	J
Los Angeles: El Segundo	LOS-E	JUL	3-6	M

Los Angeles: El Segundo	LOS-E	JUL	7-8	N
Los Angeles: El Segundo	LOS-E	AUG	7-8	O
Los Angeles: El Segundo	LOS-E	AUG	10-11	P
New York	NEW	APR or JUN	1-4	A
New York	NEW	APR or JUN	5-8	B
New York	NEW	APR or JUN	10-13	C
New York	NEW	APR or JUN	17-21	D
New York	NEW	APR or JUN	22-26	E
New York	NEW	MAY	29-30	J
New York	NEW	MAY or JUL	3-8	F
New York	NEW	MAY or JUL	8-11	G
New York	NEW	MAY or JUL	12-17	H
New York	NEW	MAY or JUL	17-21	I
Seattle	SEA	APR, JUN, or AUG	1-2	A
Seattle	SEA	APR, JUN, or AUG	3-6	B
Seattle	SEA	APR, JUN, or AUG	7-8	C
Seattle	SEA	APR, JUN, or AUG	10-11	D
Seattle	SEA	APR, JUN, or AUG	12-15	E
Seattle	SEA	APR, JUN, or AUG	16-18	F
Seattle	SEA	APR, JUN, or AUG	19-21	G
Seattle	SEA	APR, JUN, or AUG	22-24	H
Seattle	SEA	APR, JUN, or AUG	25-27	I
Seattle	SEA	APR	29-30	J
Tampa	TAM	APR or JUN	8-11	B
Tampa	TAM	APR or JUN	16-20	C
Tampa	TAM	APR or JUN	20-24	D
Tampa	TAM	MAY	29-30	J
Tampa	TAM	MAY or JUL	5-8	E
Tampa	TAM	MAY or JUL	10-13	F
Tampa	TAM	MAY or JUL	14-18	G
Tampa	TAM	MAY or JUL	19-23	H
Tampa	TAM	MAY or JUL	25-28	I
Tampa: Ybor City	TAM-Y	APR	3-6	K
Tampa: Ybor City	TAM-Y	APR	16-18	L
Tampa: Ybor City	TAM-Y	MAY	3-6	M
Tampa: Ybor City	TAM-Y	MAY	16-18	N
Tuscon	TUS	APR or JUN	1-4	A
Tuscon	TUS	APR or JUN	5-8	B
Tuscon	TUS	APR or JUN	10-13	C
Tuscon	TUS	APR or JUN	14-18	D

Tuscon	TUS	APR or JUN	19-23	E
Tuscon	TUS	MAY or JUL	3-8	F
Tuscon	TUS	MAY or JUL	8-11	G
Tuscon	TUS	MAY or JUL	12-17	H
Tuscon	TUS	MAY or JUL	17-21	I
Tuscon	TUS	JUL	29-30	J

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