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The worker scale: Developing a measure to explain gender differences in behavioral self-handicapping

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Abstract

Research has consistently found that men engage in more behavioral self-handicapping than do women. We first review evidence suggesting that these gender differences result from women placing more importance on displaying effort than do men. We then present the results of two studies seeking to develop measures of beliefs about effort that might explain these gender differences in behavioral self-handicapping. Women, across a wide range of measures, placed more importance on effort than did men. However, only a new measure of more personalized effort beliefs, dubbed the Worker scale, uniquely explained gender differences in dispositional tendency to behaviorally self-handicap. The Worker scale also predicted academic performance, consistent with the notion that these effort beliefs would predict engagement in actual behavioral self-handicaps that undermine performance.

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1. Introduction

Self-handicapping involves the creation or claiming of obstacles to successful performance, in the hopes that any subsequent failure can be blamed on the handicap (Jones & Berglas, 1978). For example, individuals have been shown to take drugs or alcohol (Berglas & Jones, 1978), withhold practice effort (Pyszczynski & Greenberg, 1983), or claim handicaps such as stress (Hirt, Deppe, & Gordon, 1991) or bad mood (Rosenfarb & Aron, 1992) prior to important tests. The more active forms of self-handicapping such as effort withdrawal or drug use have been referred to as behavioral or acquired handicaps, whereas claims of the presence of an obstacle such as stress or bad mood have been referred to as claimed or self-reported handicaps (Arkin & Baumgardner, 1985; Leary & Shepperd, 1986). This theoretical distinction is important, in that behavioral

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self-handicaps are generally more observable, controllable, and likely to be directly related to performance than are claimed handicaps (Hirt et al., 1991; Leary & Shepperd, 1986). With regard to performance, recent evidence increasingly has shown that behavioral self-handicaps, in particular reduced study effort, impair academic performance in the long term (McCrea & Hirt, 2001; Murray & Warden, 1992; Urdan, 2004; Zuckerman, Kieffer, & Knee, 1998).

This theoretical distinction is also critical with regard to several individual differences that exist in self-handicapping behavior. Jones and Rhodewalt (1982) developed the self-handicapping scale (SHS) to measure the tendency to engage in self-handicapping and excuse-making more generally. A number of studies have demonstrated the predictive validity of the scale (see Rhodewalt, 1990 for a review). Recently, McCrea, Hirt, and Hendrix (2006) factor analyzed the SHS, showing that the scale is comprised of two subscales corresponding to the distinction between claimed and behavioral self-handicapping (see Appendix). These subscales were specifically predictive of corresponding forms of self-handicapping. For example, use of claims of stress as a handicap were predicted only by the claimed subscale of the SHS, whereas use of reduced practice effort as a handicap was predicted only by the behavioral subscale of the SHS. The prediction of these self-handicapping behaviors was also improved when using the corresponding SHS subscale rather than the complete 25-item scale. Furthermore, the behavioral subscale was more predictive of lower academic performance than was the claimed subscale (McCrea et al., 2006).

One of the most consistent individual differences found in the self-handicapping literature is that men are more likely than women to engage in behavioral forms of self-handicapping, whereas both men and women are equally likely to engage in claimed self-handicapping (see Harris & Snyder, 1986; Hirt et al., 1991; McCrea, Hirt, & Milner, in press; Rhodewalt, 1990). Similarly, men tend to score higher on the behavioral subscale of the SHS, whereas women tend to score higher on the claimed subscale of the SHS (McCrea et al., 2006). To date, an explanation for these findings has not been forthcoming. Previous research has largely examined possible reasons why men would be more motivated to self-handicap than women, either because of differences in the importance of the task domain (Dietrich, 1995; Hirt, 1993; Kimble, Funk, & DaPolito, 1990), differences in the attributions made after self-handicapping by the self or others (Berglas & Jones, 1978; Hirt, McCrea, & Boris, 2003) or differences in level of concern about managing public impressions of their ability (see Hirt, McCrea, & Kimble, 2000; Rhodewalt, 1990; Rhodewalt & Davison, 1986; Snyder, Ford, & Hunt, 1985). The present work takes a different approach to explaining this finding. Specifically, we suggest that women view certain types of self-handicapping behavior more negatively than do men, and that they therefore choose to self-handicap in other ways (see also Harris & Snyder, 1986; Hirt et al., 1991). We first review prior research which supports this view.

1.1. Evidence supporting the role of effort beliefs in gender differences in self-handicapping

Earlier work on the gender difference in behavioral self-handicapping largely focused on the idea that men experience more evaluative threat and thus have greater motivation to self-handicap. For example, based on the finding that self-handicapping is at least partly motivated by impression management concerns (Kolditz & Arkin, 1982), Hirt et al. (2000) examined whether increasing the evaluative threat of a performance via public self-focus would increase behavioral self-handicapping among men and women. Although men responded to public self-focus with increased behavioral self-handicapping, women did not. In contrast, women as well as men demonstrate increased claimed self-handicapping when placed under conditions of public self-focus (Koch, Hirt, & McCrea, 2003). Furthermore, studies examining behavioral self-handicapping in less stereotypically masculine domains have also observed the same gender difference (Dietrich, 1995; Hirt, 1993). Thus, the gender difference in self-handicapping appears to be related to the characteristics of the handicap rather than differences in the motivation to protect the self.

Similar conclusions are drawn from a recent study on observer reactions to behavioral self-handicapping (Hirt et al., 2003). One could argue that women do not expect the same attributional benefits of self-handicapping in terms of observer reactions, compared to men. Indeed, the failure of women tends to be attributed to lack of ability, whereas the failure of men tends to be attributed to lack of effort (Dweck, Davidson, Nelson, & Enna, 1978; Swim & Sanna, 1996). Women may therefore have less to gain from a self-handicapping strategy. To test this possibility, Hirt et al. (2003) examined whether observers would be more critical of a woman who

behaviorally self-handicaps than a man who does so. Surprisingly, there were none of the expected effects of target gender, indicating that the self-handicap was equally unacceptable when used by a man or by a woman. However, female participants were much more critical of a self-handicapper of either gender. Although women accepted that the self-handicapper had the potential to do well in the future, they felt the target person lacked ability and was not particularly likeable. Women were more likely than were men to explain the self-handicapper's behavior in terms of more enduring character flaws such as a lack of self-control or laziness, and to suspect that the individual was self-handicapping. These findings suggest that women, more than men, place considerable value on putting forth effort, and expect others to do so as well. As a result, women may choose to claim self-handicaps rather than self-handicap behaviorally because they view the latter behaviors more negatively (Hirt et al., 1991; Hirt et al., 2003). Thus, a review of the self-handicapping literature suggests that women may place greater importance on putting forth effort in performance contexts, and this difference might explain the corresponding gender difference in behavioral self-handicapping, at least those handicaps involving reduced effort.

Certainly, other researchers have also proposed that women appear to value effort more than do men. For example, female students report studying harder, procrastinate important tasks less, and adopt more effortful learning goals and strategies than do male students (Ablard & Lipschultz, 1998; Cooper, Baumgardner, & Strathman, 1991; Stricker, Rock, & Burton, 1993; Zimmerman & Martinez-Pons, 1990). The present studies sought to examine these beliefs in more detail and thereby identify which specific effort beliefs might relate to behavioral self-handicapping and gender differences in their use. Although we focus on handicaps involving reduced effort, we suggest beliefs about effort more broadly explain gender differences in other types of behavioral self-handicapping, a point which we also address in the studies presented here.

To examine this potential explanation for gender differences in behavioral self-handicapping, we first set out to develop and identify relevant measures of effort beliefs. There are of course a myriad of effort beliefs that might be relevant to self-handicapping and academic performance. In the following section, we detail each of the measures we considered in the present studies.

1.2. Types of effort beliefs

First, individuals may differ in the extent to which they view effort as an end in itself. This belief could be more normative in nature, reflecting the impression that effort is respected by others. For example, there are pressures from parents and teachers to “always try your best.” These exhortations could presumably become internalized through socialization, such that the individual views effort as an important aspect of their self-concept and value system. Those placing more importance on effort would thus be less likely to self-handicap and more likely to negatively evaluate those who do. To our knowledge, there has not been any previous research attempting to examine gender differences in these types of beliefs.

A related possibility is that self-handicapping behavior is influenced by beliefs concerning the effectiveness of effort in improving performance. Thus, effort might be seen as a tool for achievement. For example, the Protestant work ethic suggests that personal success is a result of hard work (Mirels & Garrett, 1971). On the other hand, no such gender differences have been found in Protestant work ethic beliefs (Mirels & Garrett, 1971). Similarly, individuals differ in the extent to which they believe abilities are malleable. Dweck and colleagues (e.g., Dweck & Leggett, 1988) have examined naïve theories of intelligence and abilities, specifically whether individuals believe that they can improve over time as a result of learning (so-called incremental theorists) or that abilities are fixed (so-called entity-theorists). Individuals holding a more incremental-theorist view (and thus believing that effort enhances ability) may take a dim view of self-handicapping. There is some evidence to suggest that women are in fact more likely to subscribe to such an incremental theory perspective (Rhodewalt, 1994).

Individuals may also view self-handicapping negatively simply because they generally find putting forth effort enjoyable. It is not clear whether there might be gender differences in this type of belief.

Finally, women could value effort more than men because they are more concerned with their academic performance. Academics, at least in areas such as math, is considered stereotypically masculine (Swim & Sanna, 1996), and so women might be more concerned that they will not perform well based on their ability alone. Furthermore, female high school seniors report enjoying and placing more importance on school than

do male students (U.S. Department of Education, 2004). Thus, it could be that women value effort more as a result of placing more emphasis on academic performance.

In the present studies, we examined whether any of these measures exhibit gender differences. Next, we tested which, if any, of these measures were predictive of individual differences in the dispositional tendency to behaviorally self-handicap as measured by the behavioral subscale of the SHS (Jones & Rhodewalt, 1982; McCrea et al., 2006). As discussed earlier, the behavioral subscale of the SHS is more predictive of actual behavioral self-handicapping and academic performance than is the claimed subscale of the SHS or the complete 25-item scale. Furthermore, prior studies have shown that men tend to score higher on the behavioral subscale of the SHS (McCrea et al., 2006). Thus, a measure seeking to explain gender differences in behavioral self-handicapping would ideally mediate gender differences on this subscale. Finally, given past findings that the tendency to self-handicap, particularly via behavioral self-handicapping, is linked to poor academic performance (e.g., McCrea & Hirt, 2001; Murray & Warden, 1992; Urdan, 2004; Zuckerman et al., 1998), effort beliefs should also mediate the relationship between behavioral subscale scores and academic performance.

2. Study 1

Study 1 was intended to develop measures of effort beliefs that might explain gender differences in behavioral self-handicapping. In an earlier pretest, we asked participants to complete a set more than sixty items which assessed a broad range of beliefs about effort and academics. Based on initial exploratory analyses, we identified a smaller set of 35 items reflecting concern about academics, internalized effort beliefs, and social norms concerning putting forth effort which we examine in the present study. We also included existing measures of beliefs about effort and implicit theories of the malleability of intelligence. In addition to examining the interrelationships of these variables, we test whether there are gender differences on these measures, such that women place more importance on effort, or perceive that others do, compared to men. We next examine whether any of these measures would mediate gender differences in the dispositional tendency to behaviorally self-handicap as measured by the behavioral subscale of the Self-handicapping scale (Jones & Rhodewalt, 1982; McCrea et al., 2006). Finally, we examined whether any other these measures would account for the relationship between behavioral subscale scores and GPA. We conducted a questionnaire study to examine these issues.

3. Method

3.1. Participants

Participants were 516 (129 male, 387 female) introductory psychology students at a large Midwestern university. Participants completed the questionnaires as part of a mass testing session, and were run in groups of 10–80 students.

3.2. Materials and procedure

Participants were told that researchers at the university were interested in personality differences and pre-testing materials for future studies. Therefore, they were asked to complete a number of personality measures and questionnaires. Participants first provided their most recent GPA answering on a scale ranging from 1 'A' to 13 'F' (thus, higher scores represent a lower GPA) and their college entrance exam score (answering on a scale ranging from 1 '<600 SAT or <18 ACT' to 10 '1500–1600 SAT or 34–36 ACT'). They then completed a number of questionnaires. Among the questionnaire materials were 35 statements we had developed through pretesting. These statements were written to assess various aspects of personal beliefs about effort, subjective norms concerning effort, the importance of displaying ability relative to effort, and the concern individuals have about performing well academically. Participants were asked to read each statement and indicate their agreement using a scale from 1 (strongly disagree) to 5 (strongly agree).

In addition, participants completed the self-handicapping scale (SHS, Jones & Rhodewalt, 1982) and a five-item assessment of holding an incremental or an entity theory of intelligence (see Dweck & Leggett, 1988).

Finally, participants completed the Beliefs in the Efficacy of Effort scale (BIEE, Poehlmann, 1994). This scale was divided into three subscales on the basis of factor analysis (see also Poehlmann, 1994): belief that Effort leads to success, belief that Ability leads to success, and a factor assessing to what extent individuals report Effort enjoyment.¹

4. Results

4.1. Factor analysis of effort and academic concern scales

Because of our interest in identifying underlying factors in effort beliefs, we conducted an exploratory factor analysis of the 35 effort and academic concern items we had developed using the principle-factors method with oblimin rotation (cf., Fabrigar, Wegener, MacCallum, & Strahan, 1999). An oblique rotation was used due to the likely high correlation between the effort belief variables. Examination of the scree plot revealed a break between the fourth and fifth factors. In addition, initial analyses revealed that a four factor solution was most interpretable. We then conducted an exploratory factor analysis with oblimin rotation and extracting four factors. The first factor accounted for 19.4% of the variance, the second factor accounted for 8.2% of the variance, the third factor accounted for 6.7% of the variance, and the fourth accounted for 4.5% of the variance. We eliminated items after rotation which loaded lower than $|\cdot40|$ on all factors or higher than $|\cdot30|$ on more than one factor. The rotated factor loadings for the remaining items of each of the four factors are presented in Table 1.²

The first factor contained eight items concerning personal value placed on working hard. We therefore dubbed this scale the “Worker” scale. The items on this scale assess the extent to which an individual sees him/herself as a hard-worker and personally values these characteristics. The Worker scale is different from many previously developed scales that measure societal norms or beliefs about the link between effort and success (e.g., Protestant work ethic, Mirels & Garrett, 1971). Rather, the scale reflects a view of self as someone who personally values putting forth effort.

The second factor was composed of seven items labeled the “Academic concern” scale. The scale assesses an individual’s concerns about performing well academically.

The third factor was composed of five items concerning perceived norms about effort. This scale was labeled the “Prescriptive effort norm” scale. This scale assesses the belief that people who put forth effort should be admired. Thus, this scale assesses endorsement of and adherence to a prescriptive effort norm.

The fourth factor also concerned perceived norms about effort, although focusing more on the importance of displaying intelligence or ability as compared to displaying effort. We therefore labeled this six-item factor the “Ability vs. effort tradeoff” scale. This scale assesses the extent to which ability is viewed more positively than effort by others.

The scales also had fair to good internal reliability as measured by Cronbach’s alpha (Worker scale $\alpha = \cdot85$; Academic concern $\alpha = \cdot76$; Prescriptive effort norm $\alpha = \cdot66$; Ability vs. effort tradeoff scale $\alpha = \cdot63$).

4.2. Correlations between measures

Correlations between the measures are presented separately for men (Table 2) and women (Table 3). The newly developed measures were moderately correlated with each other. There also appeared to be moderate to strong relationships between these measures and the BIEE subscales. The results therefore do not suggest complete redundancy of these measures. Finally, the strength of relationships between the measures did not vary greatly by gender. One notable pattern was the relatively stronger negative correlations between the effort measures and college entrance exam scores among men.

¹ A self-esteem scale (Rosenberg, 1965) was also administered. However, there were no gender effects on self-esteem scores and controlling for self-esteem did not alter the results.

² We also conducted factor analyses separately for men and women. Although slight differences in item loadings were observed, the same four factor structure was found for both men and women.

Table 1
Exploratory factor analysis of items (Study 1)

Item	1	2	3	4
I tend only to work as hard as I have to in my classes	<i>-.71</i>	.01	-.17	.15
I try to devote my full effort to every class I take	<i>.71</i>	.03	.04	-.09
I pride myself in being a hard worker	<i>.67</i>	-.07	-.15	-.02
I push myself a lot to perform well academically	<i>.64</i>	.18	-.07	.01
I blow things off more than I should	<i>-.64</i>	.15	-.07	.09
My grades are the result of effort and hard work	<i>.60</i>	.07	-.05	-.04
I work hard to be successful at whatever I do	<i>.57</i>	-.01	-.25	-.01
I am proud to admit how hard I work to other people	<i>.44</i>	.00	-.13	.02
I do not feel that I have to prove myself academically	-.02	<i>-.64</i>	-.04	.11
When I do poorly, I am afraid I am letting other people down	-.17	<i>.63</i>	.02	-.06
I do not really worry much about what others think of me academically	.12	<i>-.61</i>	.02	-.01
I feel that I have to prove myself academically	.21	<i>.58</i>	.01	.09
When I do poorly at a class, I feel that I have let myself down	.09	<i>.52</i>	-.08	.03
Others have high expectations from me academically	-.10	<i>.41</i>	-.14	.02
I get really upset with myself when I do not perform well	.17	<i>.40</i>	.09	.06
Students who keep trying, even in the face of failure, should be admired	-.07	.03	<i>-.62</i>	-.02
I admire people who work hard	.11	.03	<i>-.53</i>	-.05
Grades should be based in part on how much effort you put into a class	.09	.01	<i>-.48</i>	.06
People should strive to be the best at whatever they do	.12	.06	<i>-.47</i>	-.14
Success due to effort is more meaningful than success due to ability alone	.07	-.01	<i>-.41</i>	-.06
I would rather be envied for my ability rather than appreciated for my hard work	-.08	.09	.17	<i>.51</i>
I would be satisfied knowing I had the ability to do something but only lacked the desire to do it	-.13	-.13	-.06	<i>.49</i>
It is better to be seen as someone with potential than as a person who tried and failed	.07	.08	.00	<i>.47</i>
In most classes, it is more important to appear intelligent than it is to learn the material	-.04	-.07	-.12	<i>.44</i>
I would rather be seen as competent than as a hard worker	-.11	.02	.14	<i>.43</i>
People respect ability more than they respect effort	.00	.04	-.02	<i>.42</i>

Note. Only items with coefficients higher than $|.40|$ on one factor and lower than $|.30|$ on all other factors were kept, and are marked in italics above. Factor 1, worker; factor 2, academic concern; factor 3, prescriptive effort norm; factor 4, ability vs. effort tradeoff.

4.3. Gender differences

Table 4 presents univariate statistics for the measures, including reliability coefficients and mean gender differences. As can be seen, gender differences were found on almost all of the measures assessing effort, indicating that women place higher value on effort than do men. The only exception to this pattern was that women also tended to believe that Ability leads to success more than did men. Replicating our past work (McCrea et al., 2006), men scored higher on the behavioral subscale of the SHS than did women. No differences were observed on the claimed subscale. Finally, women reported receiving better grades than did men. No gender effects were observed on the measures of Implicit theories of intelligence, Academic concern, or reported college entrance exam scores.

4.4. Predicting self-handicapping subscale scores

The next set of analyses was directed at identifying whether effort beliefs would be linked to behavioral and claimed self-handicapping, and specifically whether effort beliefs would mediate the gender difference found on the behavioral subscale of the SHS. We therefore entered gender in an initial step into the regression model predicting the behavioral subscale, and the effort belief measures that had demonstrated gender differences in a second step. These analyses are presented in Table 5. Controlling for effort beliefs reduced the gender effect on behavioral subscale scores to non-significance. The Worker, Ability leads to success, and Effort enjoyment scales were all significant predictors of behavioral subscale scores. Individuals placing more individual value on effort had lower behavioral subscale scores, as did individuals reporting enjoying effort more. Those believing ability leads to success had higher behavioral subscale scores.

Table 2
Correlations between measures among women (Study 1)

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Worker	—											
2. Academic concern	.26 [‡]	—										
3. Prescriptive effort norm	.37 [‡]	.30 [‡]	—									
4. Ability vs. effort tradeoff	-.28 [‡]	-.01	-.27 [‡]	—								
5. Ability leads to success	.26 [‡]	.10	.26 [‡]	-.42 [‡]	—							
6. Effort leads to success	.47 [‡]	.35 [‡]	.55 [‡]	-.29 [‡]	.24 [‡]	—						
7. Enjoyment of effort	.65 [‡]	.27 [‡]	.37 [‡]	-.31 [‡]	.32 [‡]	.56 [‡]	—					
8. Implicit theories	.17 [†]	.02	.16 [†]	-.18 [‡]	.22 [‡]	.20 [‡]	.21 [‡]	—				
9. Claimed subscale	-.17 [†]	.26 [‡]	.01	.19 [‡]	-.23 [‡]	-.14 [†]	-.20 [‡]	-.15 [†]	—			
10. Behavioral subscale	-.69 [‡]	-.20 [‡]	-.27 [‡]	.20 [‡]	-.13 [‡]	-.44 [‡]	-.58 [‡]	-.03	.20 [‡]	—		
11. College entrance exam	-.03	-.04	-.08	.04	.05	-.12 [*]	.03	-.09	-.03	.00	—	
12. GPA	-.19 [‡]	-.03	.09	.02	-.06	-.03	-.19 [‡]	.01	.08	.23 [‡]	-.34 [‡]	—

* $p < .05$.

† $p < .01$.

‡ $p < .001$.

Table 3
Correlations between measures among men (Study 1)

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Worker	—											
2. Academic concern	.13	—										
3. Prescriptive effort norm	.28 [†]	.27 [†]	—									
4. Ability vs. effort tradeoff	-.21 [†]	.05	-.22 [*]	—								
5. Ability leads to success	-.09	-.07	-.09	-.26 [†]	—							
6. Effort leads to success	.23 [*]	.23 [*]	.35 [‡]	-.25 [†]	.14	—						
7. Enjoyment of effort	.47 [‡]	.02	.28 [‡]	-.44 [‡]	.25 [†]	.49 [‡]	—					
8. Implicit theories	.11	-.13	.07	-.30 [†]	.13	.23 [‡]	.17 [*]	—				
9. Claimed subscale	-.20 [*]	.25 [‡]	.09	.27 [†]	-.17	-.04	-.23 [†]	-.20 [*]	—			
10. Behavioral subscale	-.60 [‡]	-.06	-.37 [‡]	.32 [‡]	-.02	-.25 [†]	-.50 [‡]	-.13	.28 [†]	—		
11. College entrance exam	-.21 [*]	-.08	-.38 [‡]	.28 [†]	-.07	-.23 [†]	-.16	-.13	.00	.20 [*]	—	
12. GPA	-.20 [*]	-.13	.06	-.09	.19 [*]	.05	.03	.07	-.06	.19 [*]	-.22 [*]	—

‡ $p < .001$.

* $p < .05$.

† $p < .01$.

Given that the Worker scale was a particularly strong predictor of scores on the behavioral subscale, we conducted a mediational analysis examining whether the Worker scale alone would explain the gender differences observed in tendency to behaviorally self-handicap. In this analysis, the gender difference on the behavioral subscale was significant ($\beta = -.093$, $t = 2.10$, $p < .05$). Adding the Worker scale alone as a second step in the regression model revealed a significant Worker scale effect ($\beta = -.676$, $t = 20.32$, $p < .001$). Furthermore, including the Worker scale in the model reduced the gender effect to nonsignificance ($\beta = .013$, $t < 1$, ns), reliably mediating this effect, Sobel test $z = 3.46$, $p < .001$.³

In the model predicting claimed subscale scores, no gender difference was observed in the initial model. However, controlling for the effort measures revealed a significant gender effect, such that women had higher claimed subscale scores than did men. In contrast to the analysis of the behavioral subscale, there was no significant effect of the Worker scale. The Ability vs. effort tradeoff scale was positively related to the claimed subscale of the SHS, indicating that those believing ability (relative to effort) is more valued by others had

³ In addition, we examined the reverse mediational model, namely that differences in the behavioral subscale would mediate gender differences on the Worker scale. However, the gender difference on the Worker scale remained significant when controlling for the behavioral subscale.

Table 4
Gender differences on measures (Study 1)

Measure	Cronbach's α	Men		Women		t	η^2
		M	SD	M	SD		
Worker	.85	26.27	6.07	28.47	6.16	3.51 [‡]	.02
Academic concern	.76	25.87	4.89	26.63	4.91	1.54	.00
Prescriptive effort norm	.66	20.48	3.02	21.65	2.54	4.30 [‡]	.03
Ability vs. effort tradeoff	.63	16.01	3.96	15.03	3.86	2.47 [*]	.01
Ability leads to success	.73	24.31	4.57	25.87	4.40	3.45 [†]	.02
Effort leads to success	.92	100.87	14.50	104.67	13.90	2.64 [†]	.01
Enjoyment of effort	.90	51.25	10.19	53.59	11.70	2.02 [*]	.01
Implicit theories	.84	20.61	5.46	21.45	5.25	1.56	.00
Claimed subscale	.68	19.75	6.74	20.73	6.98	1.38	.00
Behavioral subscale	.66	18.02	5.27	16.83	5.67	2.10 [*]	.01
College entrance exam	—	4.66	1.41	4.41	1.47	1.69	.01
GPA	—	4.16	1.64	3.56	1.70	3.49 [†]	.02

[†] $p < .01$.

^{*} $p < .05$.

[‡] $p < .001$.

Table 5
Prediction of SHS items (Study 1)

Term	Behavioral subscale			Claimed subscale		
	β	t	p	β	T	P
<i>Initial model</i>						
Gender	-.088	1.96	.05	.060	1.34	.18
	$R^2 = .01, F_{\text{Change}}(1, 499) = 3.86, p = .05$			$R^2 = .00, F_{\text{Change}}(1, 500) < 1, \text{ns}$		
<i>Final model</i>						
Gender	.020	<1	ns	.094	2.16	<.05
Worker	-.494	11.92	<.001	-.107	1.91	.06
Prescriptive effort norm	-.028	<1	ns	.181	3.56	<.001
Ability vs. effort tradeoff	.034	<1	ns	.130	2.68	<.01
Ability leads to success	.086	2.43	<.05	-.146	3.09	<.01
Effort leads to success	-.063	1.53	.13	-.053	<1	ns
Effort enjoyment	-.247	5.49	<.001	-.087	1.43	ns
	$R^2 = .51, \Delta R^2 = .50, F_{\text{Change}}(6, 493) = 83.17, p < .001$			$R^2 = .11, \Delta R^2 = .11, F_{\text{Change}}(1, 494) = 10.01, p < .001$		

higher claimed subscale scores. In addition, those believing ability leads to success had lower claimed subscale scores, whereas those believing that others expect effort had higher claimed subscale scores.

4.5. Predicting academic performance

We next examined which of these scales might best explain the finding (see Tables 2 and 3) that those scoring higher on the behavioral subscale of the SHS have lower academic performance. Therefore, we regressed GPA onto the behavioral subscale of the SHS while controlling for college entrance exam score (see Table 6). Scores on the behavioral subscale were related to worse academic performance, over and above the effects of entrance exam score. We then added all of the effort belief measures to the model in a second step. Worker scale scores significantly predicted higher GPA, whereas Prescriptive effort norm scores predicted lower GPA. None of the other individual difference measures were significant. Furthermore, including these terms reduced the behavioral subscale effect, although not completely eliminating it. To further examine this finding, we added the Worker scale alone in a second step to the model predicting GPA. In the initial model, scores on the behavioral subscale were again related to worse academic performance ($\beta = .254, t = 6.15, p < .001$), over and above the effects of entrance exam score ($\beta = -.314, t = 7.60, p < .001$). Including the Worker scale in the

Table 6
Prediction of GPA (Study 1)

Term	GPA		
	β	t	P
<i>Initial model</i>			
Behavioral subscale	.249	5.97	<.001
College entrance exam	-.310	7.44	<.001
	$R^2 = .15, F_{\text{Change}}(2, 493) = 43.20, p < .001$		
<i>Final model</i>			
Behavioral subscale	.159	2.68	<.01
College entrance exam	-.297	6.95	<.001
Worker	-.137	2.19	<.05
Academic concern	-.049	1.08	ns
Prescriptive effort norm	.108	2.14	<.05
Ability vs. effort tradeoff	.008	<1	ns
Ability leads to success	.001	<1	ns
Effort leads to success	.019	<1	ns
Effort enjoyment	-.048	<1	ns
Implicit theories	.018	<1	ns
	$R^2 = .17, \Delta R^2 = .02, F_{\text{Change}}(8, 485) = 1.51, p = .15$		

model revealed a significant Worker scale effect ($\beta = -.135, t = 2.41, p < .05$), and reduced the behavioral subscale effect ($\beta = .163, t = 2.92, p < .01$), demonstrating reliable partial mediation of this effect, Sobel test $z = 2.39, p < .05$. The effects of entrance exam score ($\beta = -.320, t = 7.78, p < .001$) remained significant.

5. Discussion

Hirt et al. (2003) argued that women may not engage in behavior self-handicapping, particularly the withdrawal of effort, because they view a lack of effort as unacceptable. That is, if women find a lack of effort unacceptable, they should be unwilling to self-handicap in this manner. Based on this previous work, we predicted that women would hold effort in higher regard than men. Indeed, across numerous measures of beliefs about effort, we found such gender differences. Women reported personally valuing effort, perceiving effort as normative, viewing the display of effort rather than ability as more important to others, believing that effort leads to success, and enjoying putting forth effort more than did men. Gender differences were not observed on the concern individuals had for academic performance, or on the measure of implicit theories of intelligence (but see Rhodewalt, 1994).

We also found evidence that effort beliefs explain gender differences in the dispositional tendency to behaviorally self-handicap, as measured by the behavioral subscale of the SHS. Analyses revealed that the Worker scale, a measure designed to assess the personal value one places on putting forth effort, uniquely mediated gender differences in the behavioral subscale of the SHS. Given past findings that the behavioral subscale of the SHS is most predictive of actual behavioral self-handicapping (McCrea et al., 2006), we believe these findings suggest the Worker scale would also explain gender differences in actual behavioral self-handicapping.

Lastly, we observed that the Worker scale also partially mediated the relationship between the behavioral subscale and GPA. Numerous studies have found links between the SHS and academic performance (e.g., McCrea & Hirt, 2001; Murray & Warden, 1992; Zuckerman et al., 1998). Furthermore, higher SHS scores appear to predict decreasing academic performance over time (even when controlling for past performance) suggesting it is not just that poor students self-handicap but that self-handicapping undermines academic performance (e.g., McCrea & Hirt, 2001; Murray & Warden, 1992; Zuckerman et al., 1998). Finally, it has been shown that behavioral self-handicapping, in particular reduced study effort, underlies this effect (McCrea & Hirt, 2001; Urdan, 2004; Urdan & Midgley, 2001; Zuckerman et al., 1998). Therefore, the ability of the Worker scale to at least partially explain this relationship provides additional evidence that it would predict actual behavioral self-handicapping. Of course, the present results are correlational in nature and therefore do not allow for a definitive test of the causal relationships between effort beliefs and academic performance. It could

be that poor academic performance also leads individuals to value effort less.⁴ Nevertheless, we believe the present results strongly suggest that the Worker scale would predict the use of behavioral self-handicaps, which in turn are likely to have negative consequences for performance.

6. Study 2

We conducted a second study to replicate the main findings from Study 1 and to examine the relationship of these effort measures (particularly the Worker scale) to other individual differences that we did not consider in the previous study. Given that the Worker scale appears to reflect the internalization of effort norms, one might argue that the scale reflects more general tendencies to adhere to norms. Research on social approval suggests that society may place more stringent standards on the behavior of women. Women are more likely to experience embarrassment (Miller, 1992), guilt (Tangney, 1990), higher fears of negative evaluation, and stronger motivations to avoid rejection (Miller, 1995) than are men, possibly reflecting pressure to adhere to social norms. As a result of holding less powerful positions in society (Eagly & Wood, 1991), women are expected to act in a more communal manner than are men, including being unselfish, dependent, and concerned with others (Bem, 1974; Eagly & Steffen, 1984; Eagly & Wood, 1991). These differences suggest that men may be allowed more freedom in choosing whether to adhere to social norms, particularly when doing so would conflict with impressions of competence or assertiveness. Such differences could manifest themselves on the Big Five personality dimensions (John & Srivastava, 1999; McCrae & Costa, 1999) of Agreeableness and Conscientiousness. Women describe themselves as more agreeable and less assertive than do men (Feingold, 1994; Rubinstein, 2005). Agreeableness has also been linked to academic achievement, in that agreeable individuals are more likely to be motivated to have good relations with instructors and peers (Hair & Graziano, 2003). There is evidence that Conscientious individuals, on the other hand, are more likely to have academic discipline (Peterson, Casillas, & Robbins, 2006), and this factor is negatively predictive of scores on the SHS (Ross, Canada, & Rausch, 2002). Women also tend to be higher in Conscientiousness than men, although this difference is relatively small (Feingold, 1994; Rubinstein, 2005). We therefore examined the relationship of these personality dimensions of the Big Five (John & Srivastava, 1999; McCrae & Costa, 1999) to the Worker scale.

We also attempted to rule out the possibility that the Worker scale reflects a more general achievement orientation. Individuals could personally value effort because they have a higher need for achievement (Jackson, 1974). Indeed, there is evidence that women value achievement more than do men (Orlofsky & Stake, 1981). Alternatively, the Worker scale could reflect overachievement (Oleson, Poehlmann, Yost, Lynch, & Arkin, 2000), in that overachievers might believe that increased effort is necessary in order to ensure success. According to Oleson et al. (2000), overachievement reflects high self-doubt accompanied by high concern with performance. Whereas self-doubt encompasses feeling uncertain about one's competence, concern with performance involves the desire to demonstrate one's worth through good performance. These researchers developed the Subjective Overachievement Scale (SOS) to assess these two aspects of overachievement. As previously discussed, there is evidence that women have more desire to demonstrate their competence in academics (U.S. Department of Education, 2004). However, gender differences have not been observed on the concern subscale of the SOS (Oleson et al., 2000). Women could also be less certain or doubtful about their academic abilities. As a result, women may be more likely to believe that effort is important in order to compensate for these perceived weaknesses. Indeed, women do report greater self-doubt on the SOS (Oleson et al., 2000), reflecting increased uncertainty about competence. Lastly, the Worker scale could simply reflect underlying differences in acceptance of the Protestant work ethic, which argues that success is achievable only through effort and hard work (Mirels & Garrett, 1971). We therefore assessed the relationship of the Worker scale to these measures in Study 2.

A second goal of the study was to examine the likelihood the Worker scale might explain gender differences in other types of behavioral self-handicapping, beyond reduced effort. Given the emphasis of the scale on valuing effort, one might expect the effects of the Worker scale would be limited to predicting the use of these

⁴ The Worker scale also partially mediated the effect of GPA on the behavioral subscale, suggesting that these relationships may indeed be bi-directional.

types of self-handicaps. We therefore separately examined two items of the behavioral subscale of the SHS dealing with drug use and inadequate sleep (see [Appendix](#)), in order to determine whether the Worker scale would mediate gender differences on these specific items as well.

A final goal of the study was to more stringently test the structure of the three effort belief scales we developed in Study 1, in order to ensure that they indeed assess different facets of valuing effort.

7. Method

7.1. Participants

Participants were 1509 (1035 female, 454 male; 20 students failed to identify their gender) introductory psychology students at a large Midwestern university who took part towards a course research participation requirement. Participants completed the measures over the internet.

7.2. Materials and procedure

Participants were told that researchers at the university were interested in personality differences and pre-testing materials for future studies. Therefore, they were asked to complete a number of personality measures and questionnaires. They first completed the items assessing beliefs and norms about effort developed for Study 1. These items were embedded in the SHS (Jones & Rhodewalt, 1982). Therefore, in the present study, individuals responded to these items on a 0 (not at all) to 5 (very much) scale. The Academic concern scale and items that had failed to load on the remaining three factors were not included in the present study.

In addition, participants completed Jackson's (1974) Need for achievement scale, Mirels and Garrett's (1971) Protestant work ethic scale, the Subjective overachievement scale (Oleson et al., 2000), and the Agreeableness and Conscientiousness subscales of the Big Five Inventory (John & Srivastava, 1999).⁵ Participants also provided their most recent GPA (answering on a scale ranging from 1 'A' to 13 'F') and college entrance exam score (answering on a scale ranging from 1 '<600 SAT or <18 ACT' to 10 '1500–1600 SAT or 34–36 ACT').

8. Results

8.1. Confirmatory factor analysis

To further test the factor structure of the three effort scales developed in Study 1, we conducted a confirmatory factor analysis using LISREL 8 (Jöreskog & Sörbom, 2005) on the items from the Worker, Prescriptive effort norm scales, and Ability vs. effort tradeoff scales. We fit a three-factor solution to the data using a maximum likelihood estimation method. We used a covariation matrix to run the analysis. For ease of interpretation, a correlation matrix is presented in [Table 7](#). The three-factor model was specified with all factors correlated. Initial runs suggested that the model would be considerably improved if measurement errors for one pair of items were allowed to correlate. Namely, Worker scale item 1 ("I tend only to work as hard as I have to in my classes", reversed) and Worker scale item 4 ("I push myself a lot to perform well academically") shared a focus on putting forth effort in order to do well academically. This modified model had a significant chi-square, $\chi^2 = 957.85$, $df = 148$, $p < .001$. This significant test was not surprising given the large sample size. However, other indices revealed a good fit for the three-factor model (GFI = .94, CFI = .94, RMSEA = .06).

As a comparison, we ran an identical analysis with a single-factor model ($\chi^2 = 3549.62$, $df = 151$, $p < .001$, GFI = .80, CFI = .83, RMSEA = .12). The single-factor model performed more poorly, with a higher chi-square ($\chi^2_{\text{change}} = 2591.77$, $df = 3$, $p < .001$) and lower fit indices than the three-factor solution. Thus, separating

⁵ Participants also completed the Rosenberg (1965) self-esteem scale, the Crowne and Marlowe (1960) Social desirability scale, the Beck Depression Inventory (Beck, 1967), and the Extraversion, Neuroticism, and Openness subscales of the Big Five Inventory (John & Srivastava, 1999). Controlling for these measures did not alter the results and so they are not discussed further.

Table 7
Correlation matrix, confirmatory factor analysis (Study 2)

	W1	W2	W3	W4	W5	W6	W7	W8	A1	A2	A3	A4	A5	A6	N1	N2	N3	N4	N5
W1	1.22																		
W2	.17	0.95																	
W3	.30	.54	1.04																
W4	.39	.29	.39	1.32															
W5	.28	.43	.54	.38	1.10														
W6	.22	.53	.52	.31	.44	1.00													
W7	.21	.39	.49	.30	.43	.45	1.06												
W8	.08	.30	.31	.15	.31	.40	.27	1.21											
A1	-.13	-.15	-.12	-.11	-.04	-.14	-.09	.00	1.33										
A2	-.15	-.21	-.13	-.18	-.04	-.15	-.12	.00	.41	1.39									
A3	-.17	-.16	-.13	-.17	-.08	-.20	-.13	-.05	.38	.34	1.21								
A4	-.08	-.14	-.07	-.10	-.02	-.08	-.07	.05	.36	.33	.32	1.26							
A5	-.13	-.06	-.02	-.12	-.01	-.07	-.06	-.05	.24	.15	.24	.19	1.25						
A6	-.10	-.06	-.02	-.07	.00	-.07	-.05	-.02	.31	.24	.23	.23	.25	1.29					
N1	-.01	.23	.18	.03	.16	.20	.16	.13	-.23	-.19	-.18	-.13	-.04	-.09	1.05				
N2	.05	.45	.29	.09	.23	.31	.22	.17	-.14	-.23	-.15	-.19	-.07	-.05	.20	0.85			
N3	.07	.18	.34	.08	.27	.22	.16	.17	-.08	-.05	-.11	-.05	-.01	.03	.19	.16	1.21		
N4	.05	.30	.25	.00	.18	.24	.20	.12	-.22	-.22	-.21	-.25	-.08	-.08	.24	.37	.25	0.87	
N5	.05	.35	.24	.05	.20	.41	.22	.15	-.21	-.21	-.18	-.22	-.05	-.06	.26	.38	.17	.44	0.84

Note: Standard deviations for each of the items are presented along the main diagonal.

the Worker scale, Ability vs. effort tradeoff scale, and the Prescriptive effort norm scale appears to be well justified.⁶

8.2. Relationships between variables

Correlations between the measures are presented separately for women (Table 8) and men (Table 9). As in Study 1, the effort measures were only weakly to moderately correlated with each other and the other individual difference measures, with the exception that the Worker scale correlated strongly and positively with both Need for achievement and Conscientiousness. Correlations did not differ greatly between men and women.

8.3. Gender differences

Reliability scores as well as gender differences for the measures are reported in Table 10. Cases in which respondents had failed to provide their gender were treated as missing for these analyses. Men scored higher than women on the behavioral subscale of the SHS. In contrast, women scored higher than men on the claimed subscale of the SHS. Consistent with the findings of Study 1, women reported placing more importance on effort across all three of the effort measures that we developed. Women reported placing more personal value on effort as measured by the Worker scale, and agreed that effort was more normative as measured by the Prescriptive effort norm and Ability vs. effort tradeoff scales, than did men. In contrast, gender differences were not observed on the Protestant work ethic scale or on the Subjective overachievement subscales of Concern and Doubt. Gender differences were also found on several other measures. Women were higher than men in Need for achievement, Agreeableness, and Conscientiousness. Women also reported higher GPA and lower college entrance exam scores than did men.

⁶ We also conducted confirmatory factor analyses separately for men and women. For men, the three factor solution ($\chi^2 = 462.86$, $df = 149$, $p < .001$, GFI = .90, CFI = .92, RMSEA = .07) was a better fit to the data than was the single factor solution ($\chi^2 = 1194.71$, $df = 152$, $p < .001$, GFI = .78, CFI = .81, RMSEA = .12). Likewise, for women, the three factor solution ($\chi^2 = 820.54$, $df = 149$, $p < .001$, GFI = .92, CFI = .93, RMSEA = .07) was a better fit to the data than was the single factor solution ($\chi^2 = 2744.89$, $df = 152$, $p < .001$, GFI = .78, CFI = .81, RMSEA = .13).

Table 8
Correlations between measures for women (Study 2)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Worker	—												
2. Prescriptive effort norm	.38 [‡]	—											
3. Ability vs. effort tradeoff	-.23 [‡]	-.27 [‡]	—										
4. Protestant work ethic	.21 [‡]	.32 [‡]	-.01	—									
5. Need for achievement	.55 [‡]	.25 [‡]	-.23 [‡]	.24 [‡]	—								
6. Concern	.29 [‡]	.26 [‡]	-.13 [‡]	.16 [‡]	.27 [‡]	—							
7. Doubt	-.26 [‡]	-.01	.29 [‡]	.08 [†]	-.26 [‡]	-.16 [‡]	—						
8. Agreeableness	.31 [‡]	.27 [‡]	-.24 [‡]	.09 [†]	.18 [‡]	.13 [‡]	-.24 [‡]	—					
9. Conscientiousness	.64 [‡]	.29 [‡]	-.26 [‡]	.17 [‡]	.49 [‡]	.24 [‡]	-.37 [‡]	.40 [‡]	—				
10. Claimed subscale	-.27 [‡]	-.07 [*]	.43 [‡]	.06	-.21 [‡]	-.15 [‡]	.54 [‡]	-.33 [‡]	-.39 [‡]	—			
11. Behavioral subscale	-.71 [‡]	-.27 [‡]	.15 [‡]	-.18 [‡]	-.43 [‡]	-.24 [‡]	.22 [‡]	-.23 [‡]	-.56 [‡]	.21 [‡]	—		
12. College entrance exam	-.04	-.06 [*]	.02	-.07 [*]	.06 [*]	-.01	-.09 [†]	-.12 [‡]	-.05	.00	.01	—	
13. GPA	-.32 [‡]	-.05	.05	-.02	-.20 [‡]	-.08 [†]	.12 [‡]	-.04	-.21 [‡]	.07 [*]	.26 [‡]	-.26 [‡]	—

* $p < .05$.
† $p < .01$.
‡ $p < .001$.

Table 9
Correlations between measures for men (Study 2)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Worker	—												
2. Prescriptive effort norm	.42 [‡]	—											
3. Ability vs. effort tradeoff	-.23 [‡]	-.39 [‡]	—										
4. Protestant work ethic	.28 [‡]	.45 [‡]	-.23 [‡]	—									
5. Need for achievement	.59 [‡]	.28 [‡]	-.26 [‡]	.35 [‡]	—								
6. Concern	.28 [‡]	.27 [‡]	-.20 [‡]	.24 [‡]	.26 [‡]	—							
7. Doubt	-.18 [‡]	-.11 [*]	.32 [‡]	.03	-.23 [‡]	-.19 [‡]	—						
8. Agreeableness	.30 [‡]	.35 [‡]	-.26 [‡]	.15 [†]	.22 [‡]	.13 [†]	-.23 [‡]	—					
9. Conscientiousness	.61 [‡]	.33 [‡]	-.31 [‡]	.31 [‡]	.55 [‡]	.37 [‡]	-.35 [‡]	.35 [‡]	—				
10. Claimed subscale	-.17 [‡]	-.09	.44 [‡]	-.12 [*]	-.20 [‡]	-.27 [‡]	.53 [‡]	-.30 [‡]	-.35 [‡]	—			
11. Behavioral subscale	-.69 [‡]	-.26 [‡]	.10 [*]	-.20 [‡]	-.48 [‡]	-.19 [‡]	.15 [†]	-.18 [‡]	-.53 [‡]	.06	—		
12. College entrance exam	-.18 [‡]	-.12 [*]	.09	-.11 [*]	-.12 [*]	-.04	-.03	-.06	-.11 [*]	.08	.09	—	
13. GPA	-.28 [‡]	.00	.00	-.02	-.16 [†]	-.15 [†]	.11 [*]	-.01	-.17	.07	.22 [‡]	-.25 [‡]	—

† $p < .01$.
* $p < .05$.
‡ $p < .001$.

8.4. Predicting self-handicapping subscale scores

The next set of analyses was directed at identifying whether effort beliefs would be linked to behavioral and claimed self-handicapping, and specifically whether effort beliefs would mediate the gender difference on the behavioral subscale of the SHS. We therefore entered gender as an initial step into the regression model, and the measures that had demonstrated gender differences in a second step. These analyses are presented in Table 11. With regard to the behavioral subscale of the SHS, controlling for the individual differences reduced the gender effect to non-significance. The Worker, Ability vs. effort tradeoff, Need for achievement, and Conscientiousness scales were all significant predictors of behavioral subscale scores. Individuals placing more personalized value on effort had lower scores on the behavioral subscale, as did individuals high in Need for achievement and Conscientiousness. Finally, those believing ability (relative to effort) is more valued by others had lower behavioral subscale scores, indicative of a suppression effect of controlling for the other individual differences.

Given that the Worker scale was a particularly strong predictor of scores on the behavioral subscale, we conducted a mediational analysis examining whether the Worker scale alone would explain the gender

Table 10
Gender differences on measures (Study 2)

Measure	Cronbach's α	Men		Women		t	η^2
		M	SD	M	SD		
Worker	.81	19.99	5.16	22.26	5.17	7.69 [‡]	.04
Prescriptive effort norm	.63	19.17	3.41	20.56	2.85	8.04 [‡]	.04
Ability vs. effort tradeoff	.71	14.56	5.06	13.58	4.84	3.49 [‡]	.01
Protestant work ethic	.68	10.16	12.34	10.69	11.64	<1	.00
Need for achievement	.69	9.25	3.31	10.05	3.13	4.32 [‡]	.01
Concern	.80	38.04	7.77	38.65	7.19	1.46	.00
Doubt	.78	27.03	6.12	27.26	6.29	<1	.00
Agreeableness	.81	32.44	5.52	34.92	5.25	8.04 [‡]	.04
Conscientiousness	.77	30.46	5.15	31.69	5.09	4.18 [‡]	.01
Claimed subscale	.72	19.46	6.85	21.51	6.73	5.26 [‡]	.02
Behavioral subscale	.65	19.60	5.28	17.82	5.42	5.81 [‡]	.02
College entrance exam	—	6.63	1.50	6.09	1.51	6.39 [‡]	.03
GPA	—	4.29	1.62	3.93	1.56	4.03 [‡]	.01

[‡] $p < .001$.

Table 11
Prediction of SHS items (Study 2)

Term	Behavioral subscale			Drug use			Inadequate sleep			Claimed subscale		
	β	t	p	β	t	p	β	t	p	β	t	P
<i>Initial model</i>												
Gender	-.142	5.00	<.001	-.171	6.10	<.001	-.072	2.53	<.05	.135	4.74	<.001
	$R^2 = .02$, $F_{\text{Change}}(1, 1215) = 25.01$, $p < .001$			$R^2 = .03$, $F_{\text{Change}}(1, 1237) = 37.16$, $p < .001$			$R^2 = .01$, $F_{\text{Change}}(1, 1242) = 6.41$, $p < .05$			$R^2 = .02$, $F_{\text{Change}}(1, 1202) = 22.43$, $p < .001$		
<i>Final model</i>												
Gender	-.014	<1	ns	-.114	4.07	<.001	-.026	<1	ns	.200	8.11	<.001
Worker	-.591	20.37	<.001	-.082	2.07	<.05	-.259	6.43	<.001	-.004	<1	ns
Prescriptive effort Norm	.004	<1	ns	-.089	2.82	<.01	.036	1.12	.26	.184	6.59	<.001
Ability vs. effort tradeoff	-.052	2.41	<.05	.012	<1	ns	-.002	<1	ns	.334	12.72	<.001
Need for achievement	-.054	2.16	<.05	-.069	2.02	<.05	.048	1.38	.17	.008	<1	ns
Agreeableness	.038	1.72	.09	-.014	<1	ns	-.017	<1	ns	-.196	7.17	<.001
Conscientiousness	-.175	6.26	<.001	-.097	2.55	<.05	-.044	1.13	.26	-.277	8.13	<.001
	$R^2 = .53$, $\Delta R^2 = .51$, $F_{\text{Change}}(6, 1209) = 217.09$, $p < .001$			$R^2 = .10$, $\Delta R^2 = .07$, $F_{\text{Change}}(6, 1231) = 15.99$, $p < .001$			$R^2 = .07$, $\Delta R^2 = .06$, $F_{\text{Change}}(6, 1236) = 14.25$, $p < .001$			$R^2 = .31$, $\Delta R^2 = .29$, $F_{\text{Change}}(6, 1196) = 83.91$, $p < .001$		

differences observed in tendency to behaviorally self-handicap. In this analysis, the gender difference on the behavioral subscale was significant ($\beta = -.154$, $t = 5.85$, $p < .001$). Adding the Worker scale alone in a second step in the regression model revealed a significant Worker scale effect ($\beta = -.708$, $t = 37.08$, $p < .001$). Furthermore, including the Worker scale in the model reduced the gender effect to nonsignificance ($\beta = -.013$, $t < 1$, ns), reliably mediating this effect, Sobel test $z = 7.53$, $p < .001$.⁷ Furthermore, additional analyses revealed that the gender effect on the behavioral subscale remained significant when controlling for Need for achievement or Conscientiousness alone.

We also investigated the specificity of this effect, examining whether effort beliefs would mediate gender differences on two individual items of the behavioral subscale related to drug use (item 20) and inadequate sleep (item 22), see Appendix. In the regression model predicting scores on the drug use item, gender was entered in a

⁷ In addition, we examined the reverse mediational model, namely that differences in the behavioral subscale would mediate gender differences on the Worker scale. However, the gender difference on the Worker scale remained significant when controlling for the behavioral subscale.

first step. This analysis revealed a significant gender difference, such that men reported being more willing to let drugs interfere with their performance than did women. The individual difference measures that had shown gender differences were then entered into the regression model in a second step. Individuals scoring higher on the Worker scale, Prescriptive effort norm, Agreeableness, and Conscientiousness scales indicated being less willing to let drugs interfere with their performance. Furthermore, controlling for these variables reduced the gender effect, although it remained significant. We then conducted a mediational analysis examining whether the Worker scale alone would explain the gender differences observed on this item. In this analysis, the gender difference on the behavioral subscale was significant ($\beta = -.168$, $t = 6.49$, $p < .001$). Adding the Worker scale alone as a second step in the regression model revealed a significant Worker scale effect ($\beta = -.233$, $t = 9.04$, $p < .001$). Furthermore, including the Worker scale in the model reduced the gender effect ($\beta = -.122$, $t = 4.76$, $p < .001$), partially mediating this effect, Sobel test $z = 5.84$, $p < .001$.

In the regression model predicting scores on the inadequate sleep item, gender was entered in a first step. This analysis revealed a significant gender difference, such that men reported being more willing to let inadequate sleep interfere with their performance than did women. The individual difference measures that had shown gender differences were then entered into the regression model in a second step. In this analysis, only the Worker scale was significant, and inclusion of the individual difference measures reduced the gender effect to nonsignificance. We again conducted a mediational analysis examining whether the Worker scale alone would explain the gender differences observed on this item. In this analysis, the gender difference on the behavioral subscale was significant ($\beta = -.087$, $t = 3.32$, $p < .01$). Adding the Worker scale alone as a second step in the regression model revealed a significant Worker scale effect ($\beta = -.268$, $t = 10.40$, $p < .001$). Furthermore, including the Worker scale in the model reduced the gender effect to nonsignificance ($\beta = -.034$, $t = 1.31$, $p > .19$), reliably mediating this effect, Sobel test $z = 6.17$, $p < .001$.

Gender was again entered in an initial step into the regression model predicting claimed subscale scores. Women had higher scores on the claimed subscale than did men. The individual differences that had shown gender differences were then entered in a second step into the model. Controlling for the individual difference measures did not eliminate the gender difference. Rather the effect became stronger, replicating the results of Study 1. In contrast to the effects on the behavioral subscale, there was no significant effect of the Worker scale. The Ability vs. effort tradeoff and Prescriptive effort norm scales were positively related to the claimed subscale of the SHS, indicating that those believing ability (relative to effort) is more valued by others as well

Table 12
Regression models predicting GPA (Study 2)

Term	GPA		
	β	t	p
<i>Initial model</i>			
Behavioral subscale	.307	10.98	<.001
College entrance exam	-.245	8.77	<.001
	$R^2 = .14$, $F(2,1102) = 91.68$, $p < .001$		
<i>Final model</i>			
Behavioral subscale	.118	2.91	<.01
College entrance exam	-.247	8.84	<.001
Worker	-.324	6.85	<.001
Prescriptive effort norm	.088	2.61	<.05
Ability vs. effort tradeoff	-.021	<1	ns
Protestant work ethic	.022	<1	ns
Need for achievement	.009	<1	ns
Concern	-.001	<1	ns
Doubt	-.006	<1	ns
Agreeableness	.017	<1	ns
Conscientiousness	.006	<1	ns
	$R^2 = .19$, $\Delta R^2 = .04$, $F_{\text{Change}}(9, 1093) = 6.29$, $p < .001$		

as those believing that others expect effort had higher scores on the claimed subscale. Those lower in Agreeableness and Conscientiousness also scored higher on the claimed subscale.

8.5. Predicting academic performance

We next examined which of these scales might best explain the finding (see also Tables 8 and 9) that those scoring higher on the behavioral subscale of the SHS have lower academic performance. Therefore, we regressed GPA onto the behavioral subscale of the SHS while controlling for college entrance exam score (see Table 12). Higher scores on the behavioral subscale were related to worse academic performance, over and above the effects of entrance exam score. We then added all of the individual difference measures to the model in a second step. The Worker scale significantly predicted better GPA whereas higher Prescriptive effort norm scores predicted lower academic performance. None of the other individual difference measures were significant. Furthermore, including these terms reduced the behavioral subscale effect, although not completely eliminating it. To further examine this finding, we added the Worker scale alone in a second step to the model predicting GPA. In the initial model, scores on the behavioral subscale were again related to worse academic performance ($\beta = .274$, $t = 10.97$, $p < .001$), over and above the effects of entrance exam score ($\beta = -.253$, $t = 10.12$, $p < .001$). Including the Worker scale in the model in a second step revealed a significant Worker scale effect ($\beta = -.280$, $t = 8.04$, $p < .001$), and reduced the behavioral subscale effect ($\beta = .076$, $t = 2.19$, $p < .05$), demonstrating reliable partial mediation of this effect, Sobel test $z = 7.86$, $p < .001$. The effect of entrance exam score ($\beta = -.272$, $t = 11.08$, $p < .001$) remained significant. Furthermore, additional analyses revealed that Need for achievement and Conscientiousness did not significantly add to the prediction of GPA beyond the effects of the Worker scale.

9. Discussion

Study 2 provided stronger support for the notion that the Worker scale would mediate gender differences in behavioral self-handicapping. The structure of the scales we developed in Study 1 was supported in a confirmatory factor analysis, reaffirming the distinctions we made between these different types of effort beliefs. Replicating Study 1, we found consistent gender differences in beliefs about effort, such that women place more personal and normative importance on putting forth effort.

Consistent with Study 1, the personal value individuals placed on effort, as measured by the Worker scale, mediated gender differences in the dispositional tendency to behaviorally self-handicap (measured by the behavioral subscale of the SHS). Moreover this effect was not limited to the reduction of effort as a handicap. We also observed mediation of gender differences on the inadequate sleep item of the behavioral subscale, and partial mediation of gender differences on the drug use item of the behavioral subscale. These findings suggest the Worker scale may mediate gender differences in a range of behavioral handicaps, not just those involving effort. In addition, there were no effects of the Worker scale on the claimed subscale of the SHS, reinforcing the notion that individuals reluctant to behaviorally handicap may instead choose to handicap in other ways.

The Worker scale also partially mediated the relationship between the behavioral subscale of the SHS and GPA, replicating the results of Study 1. As discussed earlier, it is important to note that these relationships are correlational, and thus we cannot rule out the possibility that poor academic performance reduces the value individuals place on effort.⁸ Nevertheless, this evidence further supports the notion that the Worker scale would be predictive of actual behavioral self-handicapping which has been shown to result in worse academic performance, even when controlling for past performance (McCrea & Hirt, 2001; Murray & Warden, 1992; Zuckerman et al., 1998).

⁸ As in Study 1, the Worker scale also partially mediated the effect of GPA on the behavioral subscale, suggesting that these relationships may be bi-directional.

Finally, none of the other variables we measured explained these effects of the Worker scale. Thus, of the myriad of different variables that we considered, the Worker scale appears to be the best candidate for explaining gender differences in behavioral self-handicapping.

10. General discussion

Based on past findings that women are more critical of individuals that withdraw effort (Hirt et al., 2003) and that women do not behaviorally handicap even when the evaluative threat of the performance is increased (Hirt et al., 2000), we proposed that gender differences in behavioral self-handicapping could be due to women placing more value on putting forth effort. Our goal in the present research was to develop and examine measures of effort beliefs that could be used to test this explanation. We therefore created several scales assessing both personalized and normative importance placed on effort. Specifically, the Worker scale measures personal valuation of effort, whereas the Prescriptive effort norm scale and the Ability vs. effort tradeoff scales assess more normative beliefs about putting forth effort. We also identified several existing measures that could be related to increased importance placed on effort, including implicit theories of intelligence (Dweck & Leggett, 1988), Need for achievement (Jackson, 1974), and Big Five personality dimensions (John & Srivastava, 1999), among others.

The results of the studies demonstrate that the Worker scale is the best candidate among the measures we considered for explaining gender differences in self-handicapping behavior. We found that the Worker scale has excellent psychometric properties⁹ and demonstrates robust gender differences. Furthermore, the Worker scale consistently mediated gender differences in the dispositional tendency to behaviorally self-handicap as measured by the behavioral subscale of the SHS. The present research is thus the first of which we are aware in which gender differences in dispositional tendency to behaviorally self-handicap have been demonstrated and explained. Likewise, the Worker scale partially mediated the relationship between the behavioral subscale and academic performance, suggesting effort beliefs might also play an important role in the performance consequences of self-handicapping. These effects were not explained by any of the numerous other variables we measured.

10.1. Implications for understanding gender differences in self-handicapping

The present studies suggest that differences in personalized valuation of effort, as measured by the Worker scale, would be most likely to explain gender differences in actual behavioral self-handicapping. Indeed, subsequent work by McCrea et al. (in press) using the Worker scale has found more direct evidence for these claims. First, gender differences in observer reactions to a target that insufficiently prepared for an exam were mediated by the Worker scale. Second, gender differences in reports of study effort in a psychology course were mediated by the Worker scale. Third, the Worker scale partially mediated actual behavioral self-handicapping prior to an intelligence test. In a laboratory study, half of the participants were told their test score would not be accurate if they did not practice sufficiently, whereas the other half were told their test score would not be affected by their practice effort. Whereas women practiced more when practice was said to affect performance, men did not. The Worker scale partially mediated this gender effect, demonstrating that personalized value placed on effort does at least partly explain gender differences in the use of this type of behavioral handicap.

Taken together with the present findings that the Worker scale mediates gender differences in the dispositional tendency to behaviorally self-handicap and predicts academic performance, there is accumulating evidence that women do not engage in behavioral self-handicapping (at least in part) because these behaviors conflict with the personal value they place on putting forth effort. As a result, these forms of self-handicapping are considered too costly. However, women appear to remain as motivated as men to self-handicap in other

⁹ A third study was conducted to examine the test–retest reliability of the Worker scale. Participants were 56 students in a social psychology course. They completed the Worker scale during class, and again two weeks later. The test–retest correlation of the Worker scale was $r(56) = .77, p < .001$, indicating scores were relatively stable across time.

ways. Indeed, women in the present studies actually tended to score more highly on the claimed subscale of the SHS, and numerous studies have observed that women make use of these types of handicaps as much or perhaps more than do men (Hirt et al., 1991; Koch et al., 2003). That the Worker scale did not predict scores on the claimed subscale of the SHS reinforces the point that women may not choose to behaviorally self-handicap due to increased importance placed on effort, and yet still self-handicap in other ways. Thus, gender differences in self-handicapping seem to concern the characteristics of the handicap, rather than differences in the motivation to have an excuse for failure.

Although there is now converging evidence that the Worker scale explains gender differences in self-handicapping via effort withdrawal in academic situations, the skeptical reader may question whether these findings would generalize to other types of behavioral self-handicaps and in other performance domains. This is certainly a valid concern and one which will require additional research. Given that these beliefs entail the notion that one should always try his or her best, we believe our effects will generalize to other types of behavioral self-handicaps. Although not all behavioral self-handicaps involve a withdrawal of effort, they all entail undermining one's performance in a deliberate manner. We believe this aspect of behavioral self-handicapping goes against the nature of individuals high on the Worker scale. Indeed, Study 2 demonstrated that the scale is predictive of those items of the behavioral subscale of the SHS related to drug use and inadequate sleep, and at least partly mediates gender differences on these items. Furthermore, in subsequent research, the Worker scale has been shown to predict the selection of distracting music prior to an intelligence test (Flamm, 2007; McCrea & Flamm, 2007), providing stronger evidence for this claim. Similarly, although the current version of the Worker scale is largely worded in terms of academic situations, we also believe these differences are likely to generalize to other performance domains. Future research is needed to examine how broadly these differences apply and whether a more general wording of the Worker scale would be beneficial to enable its use in other domains.

10.2. Implications for self-handicapping and academic performance

The Worker scale predicted academic performance controlling for college entrance exam scores. This finding replicates previous research (e.g., Noble, 1991; Stricker et al., 1993) demonstrating the importance of study habits and beliefs about effort in explaining over- and under-achievement (relative to standardized test scores) in college. Furthermore, the Worker scale partly explained the link between the behavioral subscale of the SHS and academic performance. That self-handicappers perform worse academically has been demonstrated in a number of recent studies (e.g., McCrea & Hirt, 2001; Urdan, 2004; Zuckerman et al., 1998). McCrea and Hirt (2001), for example, found that higher SHS scores predicted worse performance on a psychology midterm exam, and that this effect was mediated by reports of study effort (see also Zuckerman et al., 1998). In contrast, claims of stress had no effect on exam performance. Likewise, the present studies replicated past research (McCrea et al., 2006) showing that the behavioral subscale of the SHS more strongly predicts GPA than does the claimed subscale. Thus, it seems that only behavioral handicaps with relatively direct links to performance (e.g., use of impairing drugs or lack of preparation) are likely to undermine academic achievement, and these effects are also reflected in dispositional tendencies to behaviorally self-handicap. Because the Worker scale is a more general measure of individuals' willingness to engage in such behaviors, it is able to at least partly explain the poor performance of self-handicappers. Given that these results are correlational, it is of course difficult to conclusively determine whether valuing effort improves academic performance or whether better academic performance increases valuing effort. Past studies have shown that the SHS predicts impaired performance over the long-term, even when controlling for past performance (McCrea & Hirt, 2001; Murray & Warden, 1992; Zuckerman et al., 1998). Thus, future research should examine whether the Worker scale also predicts long-term consequences of self-handicapping when controlling for prior performance.

10.3. Where do gender differences in effort beliefs originate?

Although we have documented the pervasiveness of gender differences in beliefs about effort, we must also address the question of where such differences originate. It is clear from a host of literature on sex

role stereotyping that the performance of boys and girls is explained differently. In a meta-analysis by Swim and Sanna (1996), it was shown that failure is more often attributed to ability for girls and lack of effort for boys, and vice versa for success, on tasks that are considered traditionally masculine. Thus, at least for more stereotypically masculine domains (e.g., math, athletics, etc.), boys are less likely to link success with effort than are girls, and more likely to link failure with a lack of effort. If girls believe effort is required for success, they may come to internalize the inherent value of effort. We are therefore currently conducting additional research examining the role of socialization in the development of these beliefs (Harsh, Hirt, & McCrea, 2004).

Additionally, we have argued that these differences may reflect a more general tendency of women to adhere to social norms. Although the present study did not find that the effects of the Worker scale were explained by Conscientiousness or Agreeableness, it remains for further research to examine how broadly gender differences in the internalization of social norms range.

10.4. Implications for the prediction of self-handicapping behavior

The present research, as well as that of McCrea et al. (in press), demonstrates the usefulness of including the Worker scale in research concerning gender differences in behavioral self-handicapping. The utility of this measure is not limited to explaining gender differences, but could also be used to improve the prediction of self-handicapping behavior more generally. Indeed, a larger point raised by the present findings is the importance of considering the characteristics of the self-handicap when investigating the role of individual differences in this self-protective behavior. The distinction between claimed and behavioral forms of self-handicapping is a particularly important one in this regard (Harris & Snyder, 1986; see also Hirt et al., 1991; Rhodewalt, 1990). Robust gender differences are found in behavioral, but not claimed, self-handicaps (McCrea et al., in press; Rhodewalt, 1990). The behavioral vs. claimed distinction can also be made within the SHS itself (see also McCrea et al., 2006). Furthermore, splitting the SHS into behavioral and claimed subscales reveals gender differences that are otherwise obscured in the complete 25-item scale. It is therefore clear that self-handicapping tendencies are influenced not just by the perceived benefits of having an anticipatory excuse, but also the perceived costs of engaging in the handicapping behavior.

Along with the findings of McCrea et al. (2006), the present results demonstrate the utility of splitting the SHS into claimed and behavioral subscales for improving prediction of self-handicapping behavior and its consequences. Researchers interested in self-handicapping have at times struggled with the internal inconsistency of the complete 25-item scale (Jones & Rhodewalt, 1982). In the present studies, the complete 25-item scale had similar internal reliability as did each of the subscales (Study 1 $\alpha = .69$; Study 2 $\alpha = .68$), but also included items that negatively correlated with the remainder of the scale. Prior attempts to improve the internal reliability of the SHS have resulted in the use of different versions of the scale throughout the literature. Although some researchers use the complete 25-item scale (Jones & Rhodewalt, 1982), others have used Strube's (1986) 10-item version, Rhodewalt's (1990) 14-item version, or have conducted their own factor analyses to refine the scale (e.g., Martin & Brawley, 1999; Zuckerman et al., 1998). Rather than merely eliminating inconsistent items, we believe matching the subscale to the type of handicap under investigation is more appropriate and will improve prediction.

Efforts to further refine these subscales and supplement their use with additional theoretically relevant measures would also benefit researchers in the field. Indeed, several lines of recent research have attempted to do just that. For example, Oleson et al.'s (2000) work on overachievement provides the constructs of Concern with performance and self-doubt. High self-doubt and low concern with performance are predicted to relate to self-handicapping. Elliot and Church (2003) have also demonstrated links between the setting of prevention-goals, the behavioral inhibition system, and self-handicapping. In addition to these assessments of motivation to self-handicap, we would suggest that researchers interested in behavioral self-handicapping make use of the Worker scale as a supplement to such measures as an assessment of the relative attractiveness of behavioral self-handicaps. We believe approaches that combine measures of perceived benefits and costs will move the field beyond rough categorizations of who is likely to self-handicap and who is not, leading to a better understanding of the underlying psychological forces that motivate this behavior.

Appendix A

A.1. Claimed subscale of the SHS (Jones & Rhodewalt, 1982; McCrea et al., 2006)

Item Question

- 1 When I do something wrong, my first impulse is to blame the circumstances
 - 4 I suppose I feel “under the weather” more often than most people
 - 8 I am easily distracted by noises or my own creative thoughts when I try to read
 - 9 I try not to get too intensely involved in competitive activities so it will not hurt too much if I lose or do poorly
 - 15 I sometimes enjoy being mildly ill for a day or two because it takes off the pressure
 - 16 I would do much better if I did not let my emotions get in the way
 - 18 I admit that I am tempted to rationalize when I do not live up to others’ expectations
 - 19 I often think I have more than my share of bad luck in sports, card games, and other measures of talent
 - 21 I overindulge in food and drink more than I should
 - 23 I never let emotional problems in one part of my life interfere with things in my life (reversed)
 - 25 Sometimes I get so depressed that even easy tasks become difficult
-

A.2. Behavioral subscale of the SHS (Jones & Rhodewalt, 1982; McCrea et al., 2006)

Item Question

- 2 I tend to put things off to the last moment
 - 3 I tend to overprepare when I have any kind of exam or “performance” (reversed)
 - 5 I always try to do my best, no matter what (reversed)
 - 6 Before I sign up for a course or engage in any important activity, I make sure I have the proper preparation or background (reversed)
 - 11 I would do a lot better if I tried harder
 - 13 I generally hate to be in any condition but “at my best” (reversed)
 - 20 I would rather not take any drug that interfered with my ability to think clearly and do the right thing (reversed)
 - 22 When something important is coming up, like an exam or job interview, I try to get as much sleep as possible the night before (reversed)
-

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