

# Autonomy and Nondefensiveness

Holley S. Hodgins · Holly A. Yacko · Ethan Gottlieb

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**Abstract** Three experimental studies tested whether a priming procedure intended to activate an autonomy orientation would lead to nondefensiveness and enhanced performance, whether activated control orientation would lead to higher defense and impaired performance, and whether activated impersonal orientation would lead to the greatest defense and worst performance. Study 1 showed that autonomy-primed participants report lower desire for escape compared to control-primed, and that impersonally-primed showed most desire to escape. In Study 2, autonomy-primed participants showed the least self-serving bias, control-primed were in the middle, and impersonally-primed participants showed the most. In Study 3, rowers autonomy-primed showed the least self-handicapping and best performance, control-primed showed moderate levels, and impersonally-primed showed the most self-handicapping and worst performance. Results are discussed in terms of motivation orientation, defensiveness, and performance.

**Keywords** Motivation · Autonomy · Defense · Defensiveness · Bias · Athletic performance

Consciousness involves a continually changing stream of perceptual, cognitive, and emotional experience that humans use to construct an understanding of reality. There are different ways to relate to ongoing experience: Individuals can approach experience openly and engage it as it actually is, experiencing reality with relatively little distortion. Alternatively, they can devise myriad ways to defend against

experiencing events, by avoiding information or distorting at least parts of it, as if avoiding reality itself. Examples of behaviors that are used to avoid experience include escape-seeking behaviors such as substance use (Hull, 1981), self-serving attributions that protect against information (Wann & Schrader, 2000), and self-handicapping, which provides an excuse in case of failure (Hirt, Deppe, & Gordon, 1991). What these diverse behaviors have in common is that they are defensive, either through actual avoidance (e.g., of information or emotions), or of the implications of events (e.g., the personal inadequacy implied by failure). However, humans also can engage experience for what it is, without avoidance, for example, by experiencing emotion, or by accepting feedback that indicates that poor performance was due to internal factors.

## Self-Determination Theory

The purpose of this paper is to test part of the Hodgins and Knee (2002) model that posits that the ability to experience events without defensiveness is, in part, a function of motivational processes. Our perspective is grounded in a view of human motivation articulated by Self-Determination Theory (SDT; Ryan & Deci, 2000), which describes three motivation orientations—autonomy, control, and impersonal. Autonomy orientation refers to the tendency to initiate behavior out of choices that are based on awareness of one's feelings and values, and to engage in activities that promote fulfillment of the intrinsic psychological needs for self-determination, competence, and relatedness. Examples of autonomously motivated behaviors would be choosing courses and activities on the basis of interest, challenge, and growth, and developing relationships that provide meaningful connections. Empirically, autonomy orientation is associated positively with self-evaluation, self-awareness, self-actualization and ego

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H. S. Hodgins (✉) · H. A. Yacko · E. Gottlieb  
Psychology Department, Skidmore College,  
Saratoga Springs, NY 12866  
e-mail: hhodgins@skidmore.edu

development (Deci & Ryan, 1985) and higher moral reasoning and lower likelihood of cheating (Lonky & Reihman, 1990). In contrast, a control orientation is characterized by a tendency to regulate behavior by orienting to external controls and contingencies. People high in control orientation are sensitive to external demands and pressures in organizing their behavior. Control orientation would manifest in behaviors such as selecting courses, work, and relationships for external rewards such as GPA, prestige, and financial advantage. In past research, control orientation has related to a lack of self-awareness (Deci & Ryan, 1985) and the regulation of social behavior by external cues (Zuckerman, Gioioso, & Tellini, 1988). Finally, an impersonal orientation is the tendency to experience desired outcomes as unattainable and to display little sense of intentionality. Although impersonal orientation is a “motivational state,” it is characterized by a sense of inefficacy and poor functioning. Salient impersonal orientation would result in a readiness to perceive cues to failure, and a consequent lack of the effort and constructive responses that could promote success. Empirically, impersonal orientation relates to self-derogation, social anxiety, external locus of control (Deci & Ryan, 1985).

#### A model of motivation and nondefensiveness

Hodgins and Knee (2002) suggested that the three motivation orientations are an important factor that determines whether individuals approach experience nondefensively, with relatively little distortion, or defensively, as if to avoid experience. Specifically, they suggested that autonomy allows for nondefensiveness toward both internal events (e.g., emotions, perceptions, cognitions) and external events (e.g., performance feedback, interpersonal information). This is possible because, according to SDT, autonomy is associated with an integrated self (Ryan, 1995) and with secure, genuine self-esteem (Deci & Ryan, 1995); hence, under an autonomy orientation, individuals do not need to bolster self-esteem or self-protect, but can meet ongoing experiences as they are. In contrast, Hodgins and Knee (2002) suggested that control motivation requires that individuals defend against experiences because, according to SDT, control orientation is associated with an ego-involved self and contingent, vulnerable self-esteem. Thus, experiences have to be approached conditionally, according to their implication for self-worth. Finally, the model posits that, because impersonal is the least integrated orientation, characterized by ineffectiveness and high negative affect, it leads to the greatest defensiveness, even though defenses still might not establish a sense of worth.

Recent research shows support for some aspects of the model: Relative to control motivation orientation, autonomy results in higher implicit self-esteem (Hodgins, Brown, &

Carver, in press) and higher self-integration (Hodgins, 2006). The purpose of the current studies is to provide a test of the prediction about motivation and defensiveness.

#### The value of low defensiveness

Our perspective assumes that defensiveness interferes with optimal well-being, an assumption that some have shared (e.g., Horney, 1950), and research supports. For example, ignoring somatic sensations leads to more negative perception of a later stimulus (Cioffi & Holloway, 1993), suppressing emotions results in greater physiological arousal and worse mood (Mendolia & Kleck, 1993), and suppressing emotional expression degrades incidental memory (Richards & Gross, 1999). Together, the studies suggest that defending against experience carries substantial and varied costs.

In contrast, other theorists believe that defensiveness is useful or necessary. For example, although acknowledging the existence of growth-oriented motives, Greenberg, Pyszczynski, and Solomon (1995) asserted that it is not possible for humans to function without defense, that autonomy is inadequate, and defensiveness necessary for, achievement (pp. 88–89). In a consistent direction, Taylor and Brown (1988) claimed in a much-cited paper that positive illusions are adaptive and promote mental health. Later work questioned this, however (Colvin & Block, 1994), and suggested that the short-term benefits of positive illusions are accompanied by long-term costs (Robins & Beer, 2001). Supporting the costliness of distortion, meta-analytic evidence shows that avoidant coping is associated with better initial outcomes, but attentional coping predicts more positive long-term outcomes (Suls & Fletcher, 1985), and that self-enhancement is associated with positive initial impressions that deteriorate over time (Paulhus, 1998).

#### Past research relevant to autonomy and nondefensiveness

A number of studies support the hypothesis that autonomy orientation is associated with low defensiveness across many domains, whereas a nonautonomous orientation is associated with higher defensiveness. For example, individuals who were high in autonomy but low in control orientation showed less cognitive defense as evidenced by a self-serving bias (Knee & Zuckerman, 1996). A similar pattern was seen in a longitudinal study of coping, in which undergraduates who were high in autonomy but low in control orientation used fewer avoidant coping strategies (Knee & Zuckerman, 1998). In a consistent direction, highly control-oriented drivers experience more pressure, defensiveness, anger, and aggression (Neighbors, Vietor, & Knee, 2002).

Studies of social functioning show that higher autonomy orientation is associated with lower interpersonal defensiveness in everyday life. For example, in diary records of social interaction over 10 to 14 days, autonomy orientation predicts interpersonal honesty and openness, and disclosure and trust that are selectively greater in closer relationships (Hodgins, Koestner, & Duncan, 1996). In contrast, control orientation predicts focusing on who influenced the interaction, decreased self-esteem and satisfaction in interactions that are highly honest and disclosing, and lower honesty with closer relationship others. The authors interpret the patterns as consequences of interpersonal stances, with control predicting a defensive stance, and autonomy predicting an interpersonally open stance.

Consistent with these stances, in a study of responses to social predicaments, highly autonomously oriented individuals apologized and offered victims restitution, behaviors that indicate a willingness to take responsibility honestly for wrongdoing. Highly control-oriented individuals behaved very differently, using more excuses, justifications, and denials, including outright lies; hence, during interpersonal conflict, control-oriented individuals are defensive and dishonest (Hodgins, Liebeskind, & Schwartz, 1996; Hodgins & Liebeskind, 2003).

The relation of autonomy orientation to low defense is also seen in close relationships: Among married couples, high autonomy orientation predicts the use of relationship-maintaining coping strategies, whereas control orientation predicts the use of denial (Knee, Patrick, Vietor, Nanayakkara, & Neighbors, 2002). Furthermore, in romantic relationships, trait autonomy predicts relationship autonomy, which predicts low defensiveness and better response to conflict (Knee, Lonsbary, Canevello, & Patrick, 2005). Taken together, past research provides substantial support across domains for a link between individual difference measures of autonomy orientation and low defense.

#### Other research relevant to engaging versus avoiding experience

Some theory and research has addressed the issue of engaging versus avoiding experience more directly. For example, Duval and Wicklund (1972) suggested that stimuli that focus attention inward increase objective self-awareness, leading to comparing the self with a standard. They believed the comparison generally is unfavorable, and thus predicted that inward-directed attention usually results in attempts to escape self-awareness. Carver and Scheier (1981) suggested, instead, that self-directed attention is not always aversive, but only when the matching-to-standard is unfavorable (i.e., after unalterable failure), in which case individuals withdraw, either behaviorally or by cognitive disengagement, as a means of escaping self-awareness. More recently, Baumeis-

ter (1990) proposed that aversive self-awareness caused by perceived failure leads to motivation to escape from the self, or from meaningful awareness of symbolic interpretations about the self, through cognitive deconstruction, or a subjective shift to less meaningful, integrative forms of thought and awareness.

Our description of defense against experience is similar to these explanations in that we all view certain behaviors as attempts to escape the self, awareness, the negative affect associated with awareness, or reality. Importantly, however, our explanation differs in that we posit motivation orientation to be an important causal factor that determines whether individuals engage or attempt to escape from the experience of reality. One implication of the difference is that autonomously oriented individuals will not defensively attempt to escape after failure, as is generally predicted for all humans by the above theorists. Rather, when autonomy orientation is activated, events can be experienced for what they are, even following failure.

#### Nondefensiveness and performance

According to our perspective, low defensiveness should enhance performance because nondefensiveness allows for growth and self-integration over time. That is, if individuals experience events fully, all of the information that is present in the situation is available for their use in future decision making and choice among behavioral response alternatives. A more accurate understanding of the entire situation, its antecedents, and consequences should allow individuals to respond optimally, instead of only self-protectively, and lead to better functioning. In contrast, defensiveness involves avoiding information, even information that is potentially useful, and hence, defensiveness should interfere with subsequent functioning. Therefore, we predicted that autonomy orientation would enhance performance, control orientation would lead to worse performance than autonomy, and impersonal orientation would lead to the worst performance of all.

#### The present studies and hypotheses

The current paper sought to provide further evidence for the importance of autonomy orientation for engaging versus defending against experience by manipulating motivation orientations experimentally with a priming procedure in which participants are exposed to words embedded in a sentence scramble task (Bargh, Chen, & Burrows, 1996). Although the priming task is supraliminal, it is believed to activate temporarily cognitive representations at the preconscious level; the nonconsciously primed concept then operates automatically, outside of awareness, to

influence subsequent perception and behavior in prime-consistent directions. Priming has been used variously to activate traits (Bargh et al., 1996), attitudes (e.g., Fazio, Sanbonmatsu, Powell, Kardes, 1986), prejudice and stereotypes (e.g., Dovidio, Kawakami, Johnson, & Johnson, 1997), and most relevant to our studies, motivation orientations (Levesque & Pelletier, 2003). Together, the results of priming studies support that primed concepts lead to behavior consistent with the activated representations. For example, Levesque and Pelletier (2003) showed that primed motivation orientations influenced subsequent motivation-relevant outcomes, including self-reported intrinsic motivation, interest and enjoyment, perceived choice, and free-choice behavior.

In the current studies, we primed motivation orientations, and examined subsequent social behaviors that reflect defensiveness. In order to increase generalizability, we examined three different defensive behaviors. The behaviors have in common that they avoid some aspect of reality. Specifically, in Study 1, participants were asked how much they wanted to engage in behaviors that would allow them very directly to avoid their current experience. In Study 2, participants received performance feedback and made performance attributions, a frequently used measure of cognitive defense. Finally, in Study 3, athletes were given an opportunity to self-handicap (i.e., make preemptive, defensive excuses) prior to an athletic performance.

We refer to the behaviors in Study 1 as escapist because they seek to avoid experiencing what is happening in the current moment by numbing, distracting, or reducing awareness. Specifically, individuals can use alcohol, smoking cigarettes, going to sleep, and literally leaving the situation as ways to reduce cognitive awareness, self-awareness, and to disengage mentally and physically (McKirnan, Ostrow, & Hope, 1996; Moskaleiko, & Heinke, 2003), although not all instances of these behaviors are escapist. We predicted that activated autonomy orientation would lead to lower defensiveness against reality, as reflected in lower desire to engage in escapist behaviors, activated control orientation would heighten defensiveness, leading to greater desire to escape, and primed impersonal orientation would result in the greatest desire to escape of all.

## Study 1

### Method

#### *Participants*

Sixty undergraduates (43 females, 17 males) participated in partial fulfillment of a course requirement.

### Materials

#### *Motivation prime*

Following the procedure of Bargh, et al. (1996), materials were developed to prime autonomy, control, and impersonal orientations. There were three versions, each with 30 items (15 targets and 15 fillers). Participants were instructed to use the five words to construct grammatically correct four-word sentences (see Hodgins et al., in press). In keeping with similar tasks, a manipulation check was not included because priming effects depend on participants being unaware of the prime (Bargh, 1992). However, a follow-up questionnaire asked what participants believed the study investigated; one participant identified a control theme and was eliminated.

#### *Desire to escape questionnaire*

A questionnaire was constructed to measure participants' desire to engage in four behaviors that can be used to escape what is happening in the current moment. Participants responded on 15-point scales (0: not at all, 7: neutral, 14: extremely) to how much they would "right now, in this moment" like to (1) go to sleep, (2) leave the study, (3) smoke a cigarette, and (4) drink alcohol. Only a subset of participants smoked and used alcohol, thus the dependent variable was calculated as the mean of the sleep and leave items, which all participants responded to.

### Procedure

Participants were randomly assigned to prime condition and run in small groups. They completed the priming measure, several tasks unrelated to the current study, filled out the Desire to Escape and Follow-up Questionnaires, and were debriefed.

### Results

Analyses of variance were performed with between-subjects variables of Primed Motivation (autonomy, control, or impersonal) and Gender. Following Rosenthal and Rosnow (1984, pp. 346–352), planned contrasts were performed to test whether the three levels of the variable fit the precise predicted linear pattern. When a the prediction is linear, as ours was, the appropriate contrast weights are  $-1$ ,  $0$ , and  $+1$ , which test the specific prediction that primed autonomy orientation will result in the lowest defensiveness, control will show a moderate level, and impersonal will be the highest. There were no effects of Gender for any of the studies, so it will not be discussed further.

The results confirmed the hypothesis: Autonomy-primed participants showed the least desire to escape, control-primed

participants were in the middle, and impersonally-primed showed the most desire to escape ( $M_s = 8.33, 9.83, \text{ and } 11.00$ , respectively), linear contrast  $F(1, 59) = 7.65, p < .01, r = .34$ .<sup>1,2</sup>

## Discussion

Priming created shifts in motivation orientations that significantly influenced participants' desire to escape their momentary experience: Compared to those primed with autonomy, control-primed participants reported a greater desire to sleep and leave, and impersonally-primed participants reported the greatest desire. The effect occurred at least 30 min after the prime, attesting to the power of primed motivation to influence behavior. The effect size was substantial ( $r^2 = .116$ ), suggesting that 11.6% of the variance in desire to escape was accounted for by primed motivation orientations.

Why do control and impersonal orientations make people want to escape? Although the study might have been tedious, there was nothing, such as threat of failure, to escape from. Thus, the desire to leave and sleep seems to reflect a kind of nonspecific, defensive avoidance of current experience, as if control and impersonal orientations lead to restlessness and rejection of being in the moment, which is the opposite of mindfulness and being present (cf. Brown & Ryan, 2003).

Study 2 sought to extend the result to attribution bias, one of the most widely-investigated cognitive defenses used to avoid performance feedback. We manipulated success and

failure feedback and examined defensiveness in attributions. Primed autonomy orientation was hypothesized to result in the least attribution bias, control orientation in relatively greater bias, and impersonal orientation in the greatest bias of all.

A further purpose of Study 2 was to examine the effects of priming on mood. Study 1 could not rule out the possibility that negative affect caused the escape-seeking behavior. That is, perhaps the negativity of the words used to prime control (e.g., coerced) and impersonal (e.g., helpless) orientations put people in worse moods, relative to autonomy words (e.g., choice), and then negative mood led to escapism. Study 2 ought to rule out the mood explanation by including a mood measure to examine whether the prime caused negative mood independent of performance feedback.

## Study 2

### Method

#### Participants

Eighty-two college students (56 females, 26 males) participated in partial fulfillment of a course requirement.

### Materials

#### Motivation priming task

The same priming task was used as in Study 1.

#### Multiple Affect Adjective Checklist (ACL)

The ACL (Zuckerman & Lubin, 1965) is a self-report mood measure containing subscales to measure hostility, anxiety, and depression; participants check each of 132 adjectives to describe how they "feel right now at this moment." In past studies, ACL scores correlated with physiological indexes of stress and self-reported anxiety, and showed good internal consistency (Zuckerman & Lubin, 1965). We did not have separate predictions for the three subscales, and so used total scores. Internal consistency (alpha) was .90.

#### Anagram task

Participants worked on thirty anagrams (10 difficult, 10 moderate, and 10 easy) for 4 min in a constant order. Performance was not scored because the task was a cover for giving false feedback. Failure feedback was plausible because no participant completed more than 13 anagrams; success feedback

<sup>1</sup> An estimate of effect size, the Pearson  $r$ , was computed as:

$$r = \sqrt{\frac{F(1, \dots)}{F(1, \dots) + df_{error}}} \text{ (Rosenthal \& Rosnow, 1984).}$$

The magnitude of the effect is indicated by  $r^2$ , an estimate of the variance accounted for. According to Cohen and Cohen (1983, p. 61)  $r$ s of .10, .30, and .50 correspond to small, medium, and large effects, respectively. According to Rosenthal and Rubin (1982), the real-life implication of effect sizes can be illustrated with the Binomial Effect Size Display, in which  $r$  is identical to an increase in success rates obtained. For example, an  $r$  of .32 would be associated with an increase in survival rates from 18% with Drug A to 50% with Drug B.

<sup>2</sup> When the single items were analyzed individually, the Motivation Prime linear contrast for the desire to sleep item was significant,  $F(1, 59) = 4.81, p < .05, r < .27$ , for the desire to leave item was marginally significant,  $F(1, 59) = 3.94, p < .065, r < .25$ , and for the desire to use alcohol showed no effect,  $F(1, 51) = 1$ . The number of participants who smoked was very small ( $N = 19$ ) so the analysis on the single smoke item was not significant,  $F(1, 18) = 2.03, p < .18, r < .32$ , ( $M_s = 7.07, 9.54, 9.67$  for autonomy, control, and impersonal). However, despite the lack of significance, the impressive effect size suggests that 10% of the desire to smoke ( $r^2 = .10$ ) is accounted for by motivation orientation. It suggests that feeling control and especially impersonally oriented is an important trigger for smoking. It would be interesting to examine this in the future with a large sample of smokers to see if the effect is reliable.

was made plausible by providing fictitious normative performance data.

*Attribution measure*

Four items with 7-point response scales (1 = strongly disagree, 7 = strongly agree) examined attributions for anagram performance. Two internal items asked about general ability and responsibility for performance; two external items asked about situational effects and external factors that influenced performance. Internal and external subscale scores were calculated by taking the mean of the two items of each type; internal consistencies (Cronbach’s alphas) were .58 for both subscales. Although the internal consistency is low, low reliability works against finding support for the hypothesis, rather than inflating significance artificially.

*Procedure*

Participants were randomly assigned to condition and run in small groups. They completed anagrams, and the experimenter explained that he would score them while they did other tasks. The experimenter pretended to score anagrams, and after participants finished the priming and ACL, gave them false feedback. He explained that anagrams are interesting to some people, so he would return the forms. The feedback sheet contained a hand-written score and a scoring key that suggested that participants either scored above 95 percent or below 52 percent of college students in national sampling. A footnote stated that percentiles were based on scores from a large national sample in 1996–1998. Feedback forms were labeled with numbers, not names, to suggest that the experimenter did not know individuals’ scores. He called numbers aloud, placed sheets face down, and waited one minute as participants read feedback. Participants made attributions, were probed for suspicion, and debriefed, emphasizing the reason for deceptive feedback.

*Results*

*Data analytic strategy*

Analyses of variance were performed with between-subjects factors of Motivation Prime (autonomous, control, or impersonal), Feedback (success or failure), and Gender. Dependent variables included ACL scores and performance attributions. The same linear contrast weights were used for Motivation Prime as in Study 1. Contrast weights of + 1 and – 1 were assigned to success and failure to test the interaction of Feedback with Motivation Prime. For an interaction contrast, the main effect weights are multiplied to obtain cell weights for

**Table 1** Mood and attribution scores as a function of primed motivation and feedback condition (study 2)

	Primed motivation			Mean
	Autonomy	Control	Impersonal	
<b>ACL Mood</b>				
Success				
<i>M</i>	11.04	12.65	12.20	11.96
<i>SE</i>	1.02	1.02	.93	.57
Failure				
<i>M</i>	10.75	11.08	10.70	10.84
<i>SE</i>	1.02	.93	1.02	.57
<b>Attribution scores</b>				
Success				
<i>M</i>	– .49	.81	.70	.34
<i>SE</i>	.48	.44	.48	.47
Residuals	– .52	– .02	.54	
Contrast	– 1	0	+ 1	
<b>Weights</b>				
Failure				
<i>M</i>	– .09	.21	– 1.01	– .29
<i>SE</i>	.48	.48	.44	.47
Residuals	.52	.02	– .54	
Contrast	+ 1	0	– 1	
<b>Weights</b>				

*Note.* Higher mood scores indicate greater negativity. Higher attribution scores indicate greater internality. Interaction residuals indicate the effect of the interaction when both main effects have been subtracted; thus, residuals reflect the actual pattern of the interaction effect.

the Motivation Prime × Feedback interaction contrast (see Table 1). The resultant contrast weights provide a specific test of whether the self-serving bias (i.e., greater internality of attributions for success than failure) is least pronounced among autonomy-primed participants, moderate for control, and most pronounced for impersonal.

*ACL*

There was no evidence that Motivation Prime influenced mood, Prime main effect and Prime × Feedback interaction linear contrast  $F_s(1, 81) < 1$  (see Table 1).

*Attributions*

Attribution bias scores were calculated by taking the difference of the z-scored internal and external subscale scores. Scores reflect the degree to which participants made more internal than external attributions; defensiveness is evidenced by higher scores under success than failure. There was a trend for a defensive bias overall; success feedback participants made somewhat more internal attributions than did failure feedback participants,  $F(1, 81) = 2.84, p < .10, r = .18$ .

Importantly, the Feedback  $\times$  Motivation Prime interaction showed that the bias was reversed under autonomy priming, was moderate under control, and was most pronounced under impersonal, (see interaction residuals in Table 1), interaction contrast  $F(1, 81) = 4.28, p < .05, r = .22$ .<sup>3</sup>

## Discussion

Study 2 shows that, autonomy orientation causes less attribution defense after the explicit threat of failure compared to control orientation, and impersonal orientation results in even more than control. The mood data suggest that the prime did not merely influence mood: Immediately after the prime (but before feedback) there was no effect of prime on mood. Hence, there is no evidence that primed control and impersonal orientations put people in bad moods, but it does seem to prepare them to respond differentially to threat, an effect we understand in terms of the open versus defensive stances toward experience that occur as a result of motivation orientation. Relative to control and impersonal orientations, autonomy orientation allows individuals to experience events more neutrally, as they were, without self-protective distortion, even after failure. In contrast, when control orientation was activated, individuals behaved more defensively, attempting to avoid the implications of failure through cognitive biases, and this was most pronounced under impersonal orientation.

Study 3 sought to generalize the motivation and defensiveness link by examining self-handicapping, a defensive behavior used prior to performance. We also examined the effect of motivation on athletic performance, by priming collegiate rowers, allowing them to make excuses for an upcoming athletic event, and measuring actual performance. We expected that autonomy-primed rowers would make the fewest excuses and would perform the best, control-primed rowers would make more excuses and perform less well, and impersonally-primed rowers would make the most excuses and perform the worst.

## Study 3

### Method

#### *Participants*

Forty-one undergraduate collegiate rowers (24 females, 17 males) participated in two samples, two years apart. Sample 1

participants received no compensation; sample 2 participants received a Ben & Jerry's ice cream coupon.<sup>4</sup>

### Materials

#### *Motivation Prime.*

The same priming measure was used.

#### *Self-Handicapping (SH)*

A measure was constructed from a list of disruptions to practice generated by athletes (Hausenblas & Carron, 1996) to measure claimed and constructed self-handicapping (see Hirt et al., 1991). Claimed self-handicaps refer to attributions for failure given before a task as disclaimers in case of poor performance (e.g., reporting feeling ill); items included injury, illness, anxiety, depression, relationship problems, and conflict with work/classes. Constructed self-handicaps refer to actions that decrease the probability of success, and that act as defensive excuses for poor performance (e.g., getting drunk); items included going out, alcohol use, poor diet, lack of effort, lack of sleep, and procrastination. Participants rated how much each factor would interfere with rowing (1 = not at all, 7 = very). The injury and anxiety items interfered with reliability and were dropped, resulting in a 4-item Claimed scale. Internal reliabilities were .83, .89, and .89 for Claimed, Constructed, and total SH, respectively. We did not have separate predictions for the subscales, and used total scores.

#### *Rowing equipment*

Rowing performance was measured with a Concept 2 Model C Ergometer, which all participants were familiar with. Participants estimated the time in seconds it would take to row an average 500 m split of a 2,000 m distance, a typical practice task for these rowers. Log transformations were performed to correct for non-normal distributions; raw scores are presented for ease of interpretation.

### Procedure

Data were collected during two spring semesters. A teammate acted as the experimenter for the first sample, inviting every collegiate crew member to participate during a regularly scheduled practice. Two years later, an unfamiliar experimenter invited all new rowers to participate in a non-practice session. The study was explained as an investigation of athletes' behavior. Participants were randomly assigned

<sup>3</sup> Analyses that use internal and external attribution scores as a repeated measure show the identical pattern as the ones we report for self-serving attribution scores.

<sup>4</sup> Participants in Study 3's two samples did not differ significantly on the number of years of rowing experience or on any dependent variable, all  $F_s < 2$ .

to condition, completed the priming measure and SHM, estimated their rowing time, completed the 2000 m rowing piece,<sup>5</sup> were debriefed, and thanked.

## Results

### Data analytic strategy

Analyses of covariance were performed with between-subjects factors of Motivation Prime (autonomous, control, or impersonal) and Gender. Dependent variables included self-handicapping scores, and estimated and actual rowing times. The number of years of rowing experience was correlated with the dependent variables, so it was covaried in all analyses. The same planned contrasts as earlier were performed on effects that included Motivation Prime to test the linear prediction.

### Self-handicapping

As predicted, autonomy-primed rowers made the fewest anticipatory excuses ( $M = 1.91$ ,  $SE = .32$ ), control-primed rowers made more ( $M = 1.91$ ,  $SE = .30$ ), and impersonally-primed rowers made the most ( $M = 2.93$ ,  $SE = .30$ ), linear contrast  $F(1, 40) = 5.53$ ,  $p < .025$ ,  $r = .35$ .<sup>6</sup>

### Rowing

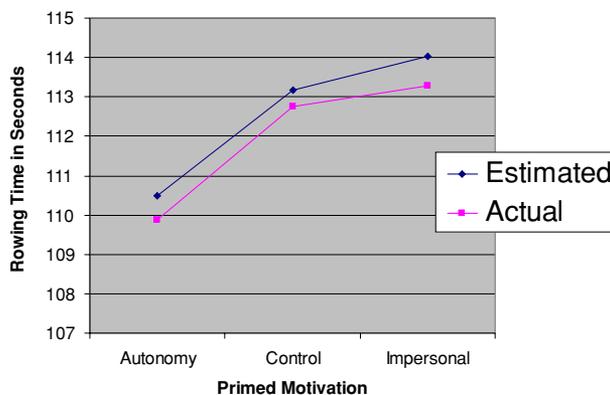
Motivation Prime also showed the predicted effect on estimated performance, linear contrast  $F(1, 40) = 5.03$ ,  $p < .05$ ,  $r = .33$ , and actual rowing,  $F(1, 39) = 4.55$ ,  $p < .05$ ,  $r = .32$ . Autonomy-primed rowers were the fastest, control-primed rowers in the middle, and impersonally-primed rowed the slowest (see Fig. 1).

### Mediation

We tested whether the effect of primed motivation orientation on rowing performance was mediated by defensiveness, as measured by SH. However, the mediator (SH) was not correlated with the outcome variables (estimated and actual rowing),  $r_s = .23$  and  $.19$ , both  $p_s > .14$ . Furthermore,

<sup>5</sup> Due to experimenter error, two males in Sample 2 of Study 3 rowed 500 m instead of 2000 m. The performance measures were estimated for these two rowers by adding 13.1 s to their estimated and actual times for the 500 m distance. This adjustment was based on data from male rowers at Florida Tech who rowed two ergometer races in a single day, one 500 m and one 2000 m; 13.1 s was the average time differential between the 500 and 2000 m distance, across heavyweight and lightweight rowers.

<sup>6</sup> Separate analyses of the Claimed and Constructed Self-Handicapping subscales also were significant, both  $F_s < 4.35$ , both  $p_s < .05$ , both  $r_s > .30$ .



**Fig. 1** Estimated and actual rowing times as a function of primed motivation (Study 3)

analyses of covariance on performance, controlling for SH did not substantially reduce the significance of the effect of Primed Motivation, both  $p_s < .07$ . Hence, our data did not meet the requirements for a mediated model (Judd & Kenny, 1981) and there is no evidence in these data that the effect of motivation on performance is mediated by defensive self-handicapping. The results therefore suggest that motivation orientation affects both defensiveness and performance, but through independent paths.

## Discussion

Primed motivation orientations influenced the defensiveness measure (SH) in the same direction as in the first two studies, and, additionally, influenced rowing performance. Autonomy-primed rowers used the least self-handicapping for an upcoming performance and performed the best, control-primed used more self-handicapping and performed worse, and impersonal-primed rowers used the most excuses and showed the worst performance. Although our best recruiting efforts in two different years resulted in modest cell sizes ( $N_s = 13$ – $14$ ), primed motivation orientation nonetheless produced medium effect sizes on performance ( $r = .32$  to  $.33$ ). Given that behaviors as complex as rowing are multiply determined, the effect sizes indicate that an impressive percent of the variance in performance was accounted for by motivation orientation.

## General discussion

The results provide evidence for a causal relation between motivation orientation and defensiveness. Motivation orientation was manipulated, so we can say that autonomy, control, and impersonal orientations cause different levels of defensiveness. The range of variables that represent

different manifestations of experiencing versus avoiding reality increases the generalizability of our findings. Together, they suggest that activated autonomy orientation causes individuals to encounter ongoing experience with relatively less defense, and experience events with less avoidance. In contrast, activated control orientation results in guardedness against experience, and impersonal orientation to the greatest defensiveness of all. We believe this occurs because the connection to the core self, needs, and values that characterizes autonomy orientation produces genuine self-esteem, lower felt vulnerability, and higher threshold for threat.

It is noteworthy, and surprised the coach, that priming influenced performance among experienced rowers (Study 3), an effect not demonstrated before, but recently replicated with an anaerobic task (Connole & Hodgins, 2006). Low defensiveness might not be widely valued for its own sake in our achievement-oriented culture, but enhanced performance surely is. There was no evidence that the priming effect on rowing was mediated by self-handicapping; hence, the mechanism by which motivation influenced performance was independent of defense in these data. Although not mediated, the independent effects on defensiveness and performance are both important. Furthermore, the current data might not provide the best test of the relations among motivation orientation, defense, and performance. In situations where the defended against information is critical for optimal subsequent judgments, defensiveness might directly harm (and mediate) performance. Future research can test this.

Why then did the prime influence athletic performance? Previous studies show an advantage of autonomy orientation for performance in non-sport domains, for example, autonomy support is associated with greater interest and conceptual learning (Grolnick & Ryan, 1987), and more autonomous learning among medical students (Williams & Deci, 1996). Also, self-determined motivation predicts behavior in sports, including exercise adherence, workout length, degree of challenge in workouts (Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997) and participation in optional activities (Ntoumanis, 2005), effects that can be understood in terms of the need satisfaction afforded by autonomy. We speculate that an autonomy orientation, even momentarily activated as in our studies, results in experiences of competence, interest, and enjoyment that support and sustain performance; in contrast, activated nonautonomous orientations lead to ego-invested concerns that undermine competence and activity engagement, decreasing performance.

A fascinating aspect of these studies is the power of a 15-word prime to influence behavior (across studies and behaviors, effect size,  $r$ , was .22 to .35, with a median of .33). Although we used a laboratory manipulation of motivation

orientation, it is analogous to the naturally-occurring priming that occurs in real life contexts. That is, individuals continually process cues from autonomy supportive, controlling, and impersonal-inducing environments, and are often unaware of those cues. Our results suggest that naturally-occurring, unattended “motivation priming” in everyday life also has powerful effects. Whether contexts are autonomy-supportive, controlling, or impersonal and undermining of competence, is a critical determinant of both defensiveness and performance. In environments that support self-determination, individuals seek fewer escapes, make fewer excuses prior to performance, use less cognitive bias following performance, expect to perform better, and actually perform better. Applied to specific contexts, it suggests that as few as fifteen autonomy-related words from a coach prior to an athletic event, from a teacher, or from a work supervisor, might decrease defensiveness and improve performance, relative to the same number of control, and especially impersonal related, words.

A design limitation of Study 1 is that we measured participants’ desire to engage in escapist behaviors rather than actual behavior. Measuring actual behavior is always preferable, and this could be examined in the future. However, it is possible that priming effects might be even stronger on actual behavior than on behavioral intention, to the extent that escapist behaviors are performed without awareness, and to the extent that social desirability leads to under-reporting escapist desires.

An interesting thing to consider is that, although our studies show that autonomy orientation causes lower defense, the negative relation between autonomy orientation and defense could be bidirectional, so that increasing the ability to experience the current moment, and not defend against it, might also strengthen autonomy orientation. If so, then activities that increase the ability to experience the current moment (such as mindfulness meditation) might increase autonomy orientation. Our results do not rule this out, and it remains an intriguing possibility for further research.

According to SDT, humans have an innate tendency to integrate experience into increasingly unified representations of themselves and their worlds. This process of integration is facilitated by, and indeed requires, low defensiveness against experience, because experience that is defended against cannot be integrated. The current paper gives evidence that autonomy is an important factor that determines whether we stay open to, or try to avoid, ongoing life experience. One implication is that the nondefensiveness associated with autonomy orientation should facilitate further integration, personal growth, and functioning, whereas the defense and avoidance of experience that results from control and especially impersonal orientations should result in further alienation from experience and impairment of functioning. The self-perpetuating nature of autonomy orientation (or its absence)

provides another compelling reason to seek out and to create environments that support autonomy.

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