

## PERSONALITY PROCESSES AND INDIVIDUAL DIFFERENCES

# When Passion Makes the Heart Grow Colder: The Role of Passion in Alternative Goal Suppression

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Quality of goal engagement and alternative goal suppression were investigated in this research. Integrating the dualistic model of passion (Vallerand et al., 2003) with goal-systems theory (Kruglanski et al., 2002), we hypothesized that *obsessive passion*—associated with recurrent goal-conflicts—would predict greater alternative goal suppression (i.e., goal-shielding) than would *harmonious passion*—characterized by effective synthesis of the passionate activity with other life domains. Results from 5 laboratory studies supported these hypotheses. In Study 1, participants' dispositional measures of harmonious and obsessive passion were correlated with an implicit measure of goal-shielding. Obsessive (but not harmonious) passion predicted the suppression of alternative goals and the progressive inhibition of unfamiliar goals. In Study 2, we extended these findings by demonstrating the interrelation between quality of goal engagement and goal-commitment such that goal-shielding effects were enhanced, but only for goals in conflict with other life domains (vs. well-integrated goals). In Study 3, the causal influence of passion on goal-shielding was supported via an experimental manipulation of passion. In Study 4, we replicated and extended Studies 1 and 3 by experimentally demonstrating that obsessive (but not harmonious) passion is a mindset conducive to the development of inhibitory links with alternative goals. Study 5 explored the psychological costs associated with repeated unconscious goal suppression by examining its effects on the depletion of self-regulatory resources. Collectively, the present results suggest that the qualitative distinction between obsessive and harmonious passion has implications for the goal-shielding effect and for subsequent self-regulatory behavior.

**Keywords:** passion, goal-systems theory, self-regulation, goal-shielding

The ability to manage multiple goals and avoid goal conflict is an important issue within social cognition. Keeping one's goals unfettered by tempting impulses can be challenging and failing to do so may entail important aversive consequences (Baumeister, Heatherton, & Tice, 1994; Fishbach, Friedman, & Kruglanski, 2003; Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008; Tang-

ney, Baumeister, & Boone, 2004). For passionate (highly committed) individuals, staying on course can be particularly important; their activity being at the heart of their lives—the activity is valued and a great deal of time and energy are invested into it—alternative goals that vie for consideration are likely to interfere with their activity. But passionate individuals each experience a different quality of goal engagement; in other words, they integrate with varying degrees of success their passionate activity with their other life domains, which influences the amount of goal-conflict they experience (Séguin-Lévesque, Laliberté, Pelletier, Blanchard, & Vallerand, 2003). One important question in that regard is the cognitive consequences associated with the chronic experience of goal-conflict. Especially, given that goal-conflict catalyzes inhibitory processes and restrains attention to a single focal goal (Shah, Friedman, & Kruglanski, 2002).

Our present interest is to test whether quality of goal engagement might moderate people's allocation of attentional resources in situations of goal-conflict, affecting their tendency to automatically inhibit alternative goals that chronically or situationally conflict with impor-

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tant life concerns. Possibly, eliminating the need to suppress such alternatives would conserve mental resources that might be depleted by suppression. The present research addressed these questions by investigating the interface between the dualistic model of passion (Vallerand et al., 2003) and goal-systems theory (Kruglanski et al., 2002). Specifically, we sought to test whether the suppression of alternative goals (the goal-shielding effect; Shah et al., 2002) depends on how integrated a core activity is with other life domains, as well as the potential costs of failing to do so.

### Goal-Shielding

Research on what makes for effective goal-pursuit has been ubiquitous in psychological research, spanning the history of the field (Fishbein & Ajzen, 1975; Lewin, 1935; Miller, 1944). One fundamental issue consistently raised is how distractions and alternative goals with a focal goal are regulated. In this regard, several authors have proposed that staying on course requires suppressing alternative action tendencies (Kuhl & Beckmann, 1994; Shallice, 1972). Considering that environmental cues can automatically activate goals, direct information processing, and influence behavior (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001; Chartrand & Bargh, 1996; Moskowitz, Wasel, Gollwitzer, & Schaal, 1999), the aptitude to stay focused on a core goal is a pivotal self-regulatory strategy. Consistent with this reasoning, Shah and Kruglanski (2002) found evidence that goal-pursuit (as measured by persistence and performance) can be undermined by the accessibility of alternative goals. When rendered accessible, alternative goals can distract a person from pursuing a focal goal by diverting from it limited attentional resources. The withdrawal of attentional resources from the focal goal occurs when alternative goals are unrelated to (vs. related to or redundant with) the focal goal.

A mechanism that helps manage multiple goals and prevents diversion of attentional resources from a focal goal has been referred to as *goal-shielding* (Shah, 2005; Shah et al., 2002). Goal-shielding automatically regulates one's attentional focus by inhibiting potentially distracting alternative goals. Using a lexical decision task, Shah and colleagues (2002) found that subliminally exposing participants to self-relevant goals led them to respond more slowly to the presentation of alternative goals. The process of goal-shielding is posited to be a process learned through extensive repetition; however, recent research (Danner, Aarts, & de Vries, 2007) has evidenced that such a process can be developed rather rapidly as well.

Interestingly, goal-shielding has been shown to occur automatically, outside of conscious awareness. However, automaticity does not mean inflexibility. On the contrary, goal-shielding is highly sensitive to goal characteristics and to motivational factors (Shah et al., 2002). The structural properties of goals are fundamental to goal-shielding. In accordance with goal-systems theory (Kruglanski et al., 2002), goals are conceptualized as cognitive representations interconnected with inhibitory and facilitative links. Conflicting goals that compete for the same attentional resources are connected with inhibitory links. The activation of a focal goal typically inhibits rival goals, which prevents the pulling away of attentional resources and maximizes resources available for pursuit of the focal goal. On the other hand, alternative goals "perceived as facilitating one's original objective may escape inhibition because of the potential benefit that could accrue from

their pursuit" (Shah et al., 2002, p. 1262). Empirical evidence has supported such a conceptualization (Goschke & Dreisbach, 2008; Shah et al., 2002; Shah & Kruglanski, 2002). Moreover, empirical evidence supports the notion that goal-commitment renders inhibition of alternative goals more acute. Goals to which individuals are fully committed are prioritized; they are shielded from interference, so that the greater one's commitment toward a goal, the greater the inhibition of alternative goals (Shah et al., 2002).

The foregoing notions lead to several testable predictions. First, if a goal (e.g., playing tennis) is appropriately integrated with alternative life domains (e.g., it is flexibly engaged vs. disengaged in accordance with other life requirements), its probability of interfering with another goal should be relatively low. Thus, well-integrated goals should not compete for limited attentional resources with alternative goals and should not develop inhibitory links with alternative goals (e.g., with carrying out work-related activities such as writing a paper). Consequently, if inhibitory links are not created, then the accessibility of alternative goals should be unaffected by the activation of a well-integrated goal. In contrast, poorly integrated goals—those that clash with other objectives—compete against alternative goals for attentional resources, and thus, they tend to develop inhibitory links with other competing goals. For this reason, the accessibility of alternative goals should be greatly reduced when a poorly integrated activity is activated. This dynamic brings us to a second testable prediction, which is that the development of inhibitory links should require repeated pairing between the poorly regulated activity and the alternative goal. Eventually, these inhibitory links should become automatic and unconsciously activated.

Thus, experiencing goal-conflicts (or learning to manage and eliminate them) may have an important bearing on individuals' goal associations and foster differential attentional focus in the presence of alternative goals. Specifically, by fostering intergoal inhibitory links, the presence (vs. absence) of chronic or situational goal-conflicts may play a key role on the occurrence of goal-shielding. A conceptual framework directly relevant to this topic is the dualistic model of passion. Passionate people are highly involved in the activity they are passionate about, and they have been so for a long time. As such, their passion may have developed chronic goal-conflicts with other activities. We now turn to a detailed description of this construct.

### The Dualistic Model of Passion

Vallerand and colleagues (Vallerand, 2008, 2010; Vallerand et al., 2003) have proposed a theory of passion concerned with motivational processes underlying heavy and sustained activity involvement. The dualistic model of passion (Vallerand, 2008, 2010; Vallerand et al., 2003) defines passion as a strong inclination toward a self-defining activity that one loves and finds important and in which one invests a significant amount of time and energy. These passionate activities become self-defining and come to represent central features of one's personal identity. For instance, individuals with a passion for basketball do not simply play basketball; they *define* themselves as "basketball players." Importantly, the passion model posits that equally important activities can be pursued differently with a variety of consequences (Vallerand, 2008, 2010; Vallerand et al., 2003). Specifically, two distinct types of passion are proposed—harmonious and obsessive—

differentiated in terms of how the passionate activity is regulated and integrated with other life domains.

*Obsessive* passion refers to a strong and uncontrollable urge to partake in the activity. Activities pursued in this way tend to overwhelm one's attention and consume one's mental resources; the activity becomes out of the individual's control and produces a psychological pressure to continuously pursue it. This type of engagement leads to a rigid (rather than flexible) engagement in the activity (Vallerand et al., 2003). As a consequence, the activity becomes difficult to regulate and integrate with other spheres of life, ultimately producing tensions and conflicts (Vallerand et al., 2003).

The second type of passion, *harmonious passion*, is as important to the individual as the obsessive passion, and it similarly prompts a strong desire to engage in the activity. However, harmonious passion refers to a strong desire to freely engage in the activity, wherein the person regards the activity as a significant—but not overwhelming—part of their identity. With harmonious passion, the person is in control of the activity and freely decides whether or not to engage in it under given circumstances. Because of the sense of control over the activity, harmonious passionate activity is experienced as coherent and well integrated, rather than in conflict, with other life domains (Séguin-Lévesque et al., 2003; Vallerand et al., 2003).

Empirical findings have been consistent with the foregoing conceptualization. Whereas both harmonious and obsessive passion were found to be associated with similar commitment to the activity, they have been also found to be associated with very different outcomes (Vallerand et al., 2003).

Harmonious passion has been found to be positively related, whereas obsessive passion was either unrelated or negatively related to psychological adjustment indices (Philippe, Vallerand, & Lavigne, 2009; Rousseau & Vallerand, 2008; Vallerand et al., 2003, Study 2; Vallerand et al., 2007), positive emotions, and the experience of flow during activity engagement (Lafrenière, Jowett, Vallerand, Donahue, & Lorimer, 2008, Study 2; Vallerand et al., 2003, Study 1; Vallerand, Rousseau, Grouzet, Dumais, & Grenier, 2006, Study 2). Moreover, harmonious passion has been found to be negatively related, whereas obsessive passion has been found to be positively related, to rigid activity engagement (Rip, Fortin, & Vallerand, 2006; Vallerand et al., 2003, Studies 3 and 4).

Of importance to the present article, rigid persistence toward the passionate activity may lead the person to experience conflict with other aspects of his or her life. Séguin-Lévesque et al. (2003) addressed this issue with regular Internet users who were in a relationship. The results demonstrated that controlling for the number of hours that people spent on Internet, obsessive passion for the Internet was positively related to conflict with one's romantic partner, whereas harmonious passion was unrelated to it. In addition, Vallerand, Mageau, et al. (2008) and Vallerand, Ntoumanis, et al. (2008, Study 3) replicated the above results with soccer fans. Greater levels of obsessive passion for soccer were associated with a larger experience of conflict between soccer and individuals' romantic partner. Additionally, research (Vallerand et al., 2003, Study 1; Vallerand et al., 2010) revealed that this effect is not limited to romantic relationships. Indeed, obsessive passion has been found to be positively associated with conflict in other life domains as well (Vallerand et al., 2003, Study 1; Vallerand et al., 2010, Study 1) and positively predicted conflict in those domains over a 6-month period (Vallerand et al., 2010, Study 2). Overall, these findings suggest that obsessive—but

not harmonious—passion is associated with a greater experience of goal-conflict.

The passion construct was originally represented as a stable individual difference measured on continua of harmonious and obsessive passion (Vallerand et al., 2003). However, Vallerand (2010) also posited that harmonious and obsessive passion could also be seen as a mindset that can be instigated situationally. Indeed, theorists have proposed and adduced evidence that the concept of personality is simply "one source of variability in the functioning of psychological principles that also varies across momentary situations" (Higgins, 2008, p. 612); thus, psychological constructs are dynamic and can be operationalized both in terms of individual differences and short-lived situation (for review and discussion, see Kruglanski & Sheveland, in press).

The two passions have been shown to be relatively independent from each other (weak or absent correlations between the two constructs). As such, at any given moment, both passions can be high or low, or one could be high and the other, low. However, different situations give rise to a different predominance of harmonious or obsessive passion. If harmonious passion becomes predominant, individuals are more likely to act and experience outcomes related to harmonious passion; the same principles apply for obsessive passion. Thus, individuals can be high on both harmonious and obsessive passion; however, the predominant type of passion will determine how one will regulate his or her activity. Similar type of functioning (e.g., locomotion and assessment) have been empirically supported (Higgins, Pierro, & Kruglanski, 2008; Orehek, Mauro, Kruglanski, & van der Bles, 2012).

One factor that has been found to influence the predominance of harmonious or obsessive passion is the autonomy support of the social environment. Autonomy support generally refers to allowing individuals to make important choices with regard to achieving their goals. In academic settings, an example of autonomy support is allowing students to choose when and how they would like to study. Mageau et al. (2009, Study 3) investigated first-year high school students who had *never* played a musical instrument before and who were taking their first music class. Results demonstrated that out of the 36% of participants who developed a passion for music toward the end of the semester, high perceived autonomy support from close adults predicted harmonious passion. In contrast, lack of autonomy support from the parents predicted obsessive passion. Similar results were obtained in two other cross-sectional studies with respect to other types of activities (Mageau et al., 2009, Studies 1 and 2). Other evidence in the industrial/organizational literature support similar ideas. Two studies by Houliort and Vallerand (2012) investigated leadership style and organizational culture. It was found that transformational leadership and a clan culture (focusing on collaboration, commitment, and communication) provide room for experiencing autonomy at work and, thus, facilitate harmonious passion for work. Conversely, transactional leadership and a market culture (focusing on competition, goal achievement, and profitability), both known to undermine autonomy support, positively predict obsessive passion. In sum, these results converge on the idea that a controlling environment that undermines autonomy support fosters obsessive passion, whereas one that promotes autonomy support creates an environment favorable to harmonious passion.

The concept of passion has partial resemblance to other psychological concepts such as intrinsic and extrinsic motivation (Deci &

Ryan, 2000). Intrinsic motivation is similar to passion, as both involve interest and liking toward the activity. However, intrinsically motivated activities are typically not seen as central to the person's identity (Deci & Ryan, 2000), whereas passion is so defined. Furthermore, extrinsic motivation does not entail performing the activity out of enjoyment but rather in order to obtain a reward external to the activity. Therefore, the fundamental difference between extrinsic motivation and passion is the lack of liking for the extrinsically motivated activity in contrast to considerable liking for the passionate activity. In this vein, Vallerand et al. (2003, Study 2) empirically demonstrated that harmonious and obsessive passion predict changes in positive and negative affect, over and beyond changes related to intrinsic and extrinsic motivation. Overall, although passion and intrinsic and extrinsic motivation are both related to motivational differences, they nonetheless constitute distinct constructs.

### Overview of Studies

The present research investigated the interface between the dualistic model of passion and goal-systems theory. Specifically, our purpose was to test whether suppression of alternative goals depends on how individuals have integrated their passion with other life domains, as well as examining the potential costs of failing to do so. Across all five studies, it was expected that the type of passion—reflecting the *quality* of goal engagement—would determine alternative goal suppression. Specifically, we proposed that individuals with a strong obsessive passion orientation for an activity, that is, people with goals either chronically or situationally in conflict (as opposed to well-integrated) with other life domains would tend to (a) inhibit alternative goals by (b) progressively developing inhibitory links with them. Additionally, individuals with conflict-related goals would (c) exhibit stronger inhibitory effects as a function of their commitment toward their goals. Finally, (d) repeatedly suppressing alternative goals should deplete self-regulatory resources and impair future self-regulatory attempts.

In Study 1, consistent with previous research (Séguin-Lévesque et al., 2003; Vallerand et al., 2003, Study 1; Vallerand, Ntoumanis, et al., 2008) in which obsessive passion has been associated with greater goal-conflict, we hypothesized that obsessive passion would predict the suppression of alternative goals. In contrast, because harmonious passion is unrelated to goal-conflict, it should be unrelated to goal-shielding (i.e., goal accessibility should be unaffected by the activation of an alternative goal). Furthermore, we examined the process through which goal-shielding occurs. We investigated whether the repeated pairing of a passionate activity with a new goal would create inhibitory links between them. We predicted that the strength of these inhibitory links would become stronger as a function of how poorly the passionate activity is regulated with other goals, that is, as a function of higher levels of obsessive passion.

In Study 2, we revisited the role of goal-commitment in goal-shielding and examined its relationship with quality of goal engagement. Specifically, in contrast with Shah et al.'s (2002) finding that goal-commitment accentuates goal-shielding, we hypothesized that goal-commitment would only accentuate goal-shielding for poorly regulated goals and not for goals well-integrated with other life domains. Additionally, Study 2 addressed the alternative explanation that obsessive passion may be associated with greater activity *commitment*, leading to greater goal-

shielding. We predicted no quantitative differences between passion type and goal-commitment, thus supporting the view that the difference between harmonious and obsessive passion lies in the *quality* rather than *intensity* of engagement.

The main purpose of Study 3 was to attempt to replicate the findings of Studies 1 and 2 using an experimental design which directly manipulated individuals' type of passion, testing for a causal link between obsessive passion and goal-shielding. In so doing, Study 3 examined whether obsessive and harmonious passions are mindsets that can influence how individuals situationally respond to alternative goals. Because obsessive (but not harmonious) passion focuses on intergoal conflict, we hypothesized that individuals in such a mindset would tend to shield their goals from alternative goals.

Because goal-shielding has been theorized to be a learned process that develops overtime (Shah et al., 2002), Study 4 sought to replicate and extend the results of Study 3 by demonstrating the process through which situationally induced obsessive passionate mindsets lead to alternative goal suppression. We predicted that because the obsessive passion mindset focuses on goal-conflict, it would foster the development of inhibitory links between a passionate activity and new alternative goals. We hypothesized that these links would progressively develop and eventually become strong enough to create inhibition of alternative goals. Additionally, Study 4 addressed the potential confound between harmonious/obsessive passion and intrinsic/extrinsic motivation, respectively.

Finally, in Study 5, we investigated the consequences of goal-shielding on self-regulatory resources. We predicted that repeated alternative goal suppression due to obsessive passion would deplete self-regulatory resources, in turn, undermining subsequent self-regulatory performance. Such depletion was hypothesized not to take place with harmonious passion. A detailed description of the different studies is provided below.

### Study 1

The major aim of Study 1 was to test our main predictions regarding passion and goal-shielding. Building on prior work suggesting that goal-shielding is a self-regulatory strategy utilized to manage goal-conflict (Shah et al., 2002), we expected that the type of passion would moderate the goal-shielding effect. Specifically, given that obsessive passion is related to chronic experiences of goal-conflict (Séguin-Lévesque et al., 2003; Vallerand et al., 2003, Study 1; Vallerand, Ntoumanis, et al., 2008, Study 3), we hypothesized that higher levels of obsessive passion would predict greater inhibition of alternative goals. In contrast, harmonious passion being unrelated to experience of chronic goal-conflict but characterized by effective synthesis of the passionate activity with other life domains (Vallerand et al., 2003), we predicted that harmonious passion would not predict goal-shielding.

A second aim of Study 1 was to test whether obsessive passion could also be associated with the suppression of alternative goals that have never been pursued before. Previous research (Shah et al., 2002) has made the theoretical proposition that alternative goal suppression is learned and rendered unconscious over time; we sought to put this proposition to empirical scrutiny. Specifically, we tested whether the repeated pairing of a passionate activity with an activity that has never been pursued before would lead to the development of inhibitory links between the two. We predicted that the strength of these inhibitory links would become stronger as



a function of how poorly the passionate activity is regulated with other goals, that is, as a function of individuals' levels of obsessive passion (but not harmonious passion).

To test these predictions, we relied on an implicit measure to assess goal-shielding. This technique involved comparing reaction times to a target goal construct after subliminal exposure to either a neutral or a goal prime and offered a more direct test of inhibitory processes than self-report measures. Slower reaction times to the target goal construct after exposure to a goal prime, as opposed to a neutral prime, are assumed to reflect inhibitory processes. This methodology has been used effectively in the past to investigate goal-shielding processes (see Shah et al., 2002).

## Method

**Participants.** Thirty-one University of Maryland undergraduate psychology students (23 women, 8 men;  $M_{\text{age}} = 19.32$  years,  $SD_{\text{age}} = 1.49$  years) participated in the study in exchange for monetary payment.<sup>1</sup>

**Procedure and measures.** Upon arrival to the lab, participants were ushered to a private room. Participants were told to "determine an activity that you like, that is important to you, and in which you invest a significant amount of time on a regular basis," (the definition of passion) and then asked to respond to the Passion Scale for this activity (Vallerand et al., 2003). Activities reported by participants included a variety of behaviors (e.g., running, shopping, and yoga). The Passion Scale (see Appendix A) consists of two six-item subscales assessing harmonious ( $M = 5.31$ ,  $SD = 0.97$ ) and obsessive passion ( $M = 2.42$ ,  $SD = 1.11$ ). Participants rated their agreement to each of these items on a 7-point scale ranging from 1 (*do not agree at all*) to 7 (*completely agree*). The Passion Scale has displayed high levels of validity and reliability with respect to a variety of activities (Vallerand et al., 2003, Study 1) and contexts (e.g., Bonneville-Roussy, Lavigne, & Vallerand, 2011; Carbonneau, Vallerand, Fernet, & Guay, 2008; Castelda, Mattson, Mackillop, Anderson, & Donovan, 2007; Lafrenière, Vallerand, Donahue, & Lavigne, 2009; Vallerand & Houliort, 2003). The harmonious passion subscale included items such as, "My activity is in harmony with the other activities in my life" (Cronbach's  $\alpha = .76$ ), whereas the obsessive passion subscale included items such as "I have an almost obsessive feeling for my activity" (Cronbach's  $\alpha = .81$ ).

Participants were then asked to indicate a second important activity (the *alternative goal*) that they enjoyed engaging in on a regular basis. Finally, participants were asked to report an activity that they had never performed before but thought could be pleasant to do (the *pleasant activity*). At that point, participants were ushered to a different room to engage in a lexical decision task on the computer. Using a methodology similar to that employed by Shah et al. (2002), participants judged whether a target word represented an important activity or not. Participants were instructed to do this as quickly as possible. Unbeknownst to participants, a subliminal prime word was presented for a period of 17 ms, backward masked to ensure it did not reach the threshold of conscious awareness (Rayner, 1978). The prime word appeared in the center of the screen, and the prime word was replaced by a masking letter string (xxxxxxxxxxxx) that was at least equal in length to the primes to avoid conveying any additional meaning.

Subsequently, a target word replaced the mask. The primes and target words included in the lexical decision task were the name of the passionate activity, the alternative goal, the pleasant activity, and two neutral words (i.e., table and chair). No trials contained the same prime and target words simultaneously. Each possible prime-target combination was presented six times. Overall, 120 trials were presented. The task took approximately 7 min to complete. A funneled debriefing procedure (Chartrand & Bargh, 1996) was used to assess whether participants had guessed the nature of the study or had seen the subliminal primes. No participant reported any suspicion about the study or reported seeing the primes after being told that they were presented on the screen.

## Results

**Preliminary analyses.** Incorrect responses during the lexical decision task were first removed (see Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, 1990).<sup>2</sup> Subsequently, participants' reaction times were transformed using a natural log transformation to reduce the influence of outliers. Responses were excluded if they exceeded more than 3 standard deviations from the mean (Bargh & Chartrand, 2000; Fazio, 1990). Corresponding response times were averaged.

**Data analysis.** Data were analyzed using hierarchical linear modeling (HLM) with HLM 6.0 (Raudenbush, Bryk, & Congdon, 2004), given that the present study involved a hierarchically structured data set where reaction times are nested under participants' dispositional measures (i.e., harmonious and obsessive passion). HLM accounts for the shared variance due to multiple observations within the same participant. Therefore, the parameter estimates generated from HLM (particularly the standard errors) are less biased than are those generated from analysis of variance (ANOVA) when the data are nested within participants. The following HLM analyses were conducted with the restricted maximum likelihood method of estimation. All dispositional variables were centered at the sample mean (Raudenbush & Bryk, 2002).

HLM analyses were conducted to predict the inhibitory effect of the passionate activity on the target word. Accordingly, reaction times to the alternative goal where the prime was the passionate activity were contrasted to reaction times where the prime was a neutral word. Prime categories were thus dummy coded with a score of 1 assigned to reaction times primed with the passionate activity and a score of 0 assigned to those primed with a neutral word. All ensuing HLM analyses were conducted using the same procedure. All HLM equations are presented in Appendix B. Unstandardized coefficients are reported.

### Main analyses.

**Alternative goal suppression.** HLM analyses were conducted to predict reaction times to the alternative goal from harmonious and obsessive passion (between-person factors), prime categories (within-person factor), and their interactions. Results (see Table 1) showed that harmonious and obsessive passion did not predict reaction times (all  $ps > .05$ ). Furthermore, the results demonstrated

<sup>1</sup> Participants' gender did not yield any effects on any dependent variables across studies, hence gender is omitted from further consideration.

<sup>2</sup> No systematic differences were found in participants' error rate on the lexical decision trials for any of the reported studies. The average error rate for the lexical decision trials was 4.2% for Study 1, 2.5% for Study 2, 2% for Study 3, and 3.6% for Study 4.

Table 1  
Results of the HLM Analysis Predicting Reaction Times to the Alternative Goal From  
Harmonious and Obsessive Passion and Prime Categories (Log ms): Study 1

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion	−0.00	−0.17	.87
Obsessive passion	0.01	1.00	.17
Prime categories	0.03	2.20	.03
Harmonious Passion × Prime Categories	−0.01	−0.91	.37
Obsessive Passion × Prime Categories	0.02	2.26	.03

Note. *N* = 31. HLM = hierarchical linear modeling.

that the “Harmonious Passion × Prime Categories” interaction did not predict reaction times ( $B = 0.02, p = .37$ ).<sup>3</sup> However, results showed that prime categories predicted reaction times to the alternative goal ( $B = 0.03, p = .03$ ). Specifically, slower reaction times were observed on trials that exposed participants to their passionate activity than on trials that exposed participants to a neutral word. Furthermore, results revealed that the within-person relationship between prime categories and reaction times was moderated by obsessive passion (i.e., “Obsessive Passion × Prime Categories” interaction;  $B = 0.02, p = .03$ ).

Follow-up simple slope tests (Aiken & West, 1991) for the “Obsessive Passion × Prime Categories” interaction showed that for individuals who were high (i.e., one standard deviation unit above the mean) on obsessive passion, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed ( $B = 0.05, t = 3.75, p = .00$ ). In contrast, for individuals who were low (i.e., 1 standard deviation unit below the mean) on obsessive passion, reaction times to the alternative goal were unaffected by prime categories ( $B = 0.00, t = 0.15, p = .88$ ). In sum, as expected, the inhibitory effect of the passionate activity on the alternative goal was more pronounced with higher levels of obsessive passion. Figure 1 illustrates the pattern of results.

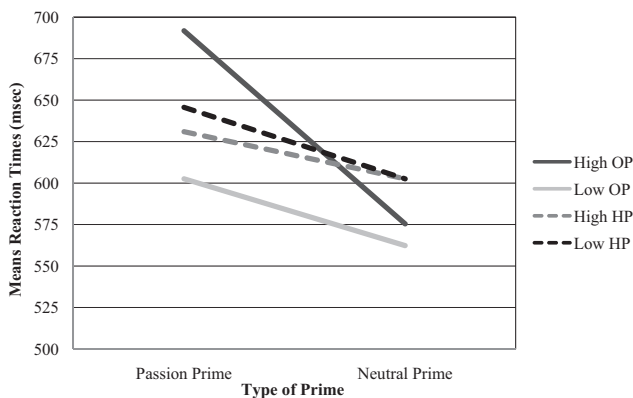


Figure 1. Reaction times for recognizing alternative goal when primed with the passionate activity or with a neutral word as a function of participants' levels of obsessive and harmonious passion (Study 1). OP = Obsessive Passion; HP = Harmonious Passion; High = 1 standard deviation higher than the mean on the subscale; Low = 1 standard deviation lower than the mean on the subscale.

We also examined whether the inhibitory processes associated with obsessive passion were specific to words associated with alternative goals or even generalized to other kinds of words. Accordingly, reaction times to a neutral word (i.e., chair) where the prime was the passionate activity were contrasted to reaction times where the prime was a neutral word (i.e., table). Prime categories were thus dummy coded with a score of 1 assigned to reaction times primed with the passionate activity and a score of 0 assigned to those primed with the neutral word (i.e., table). HLM analyses were then conducted to predict reaction times to the neutral word from harmonious and obsessive passion (between-person factors), prime categories (within-person factor), and their interactions. Results indicated that reaction times were not predicted by any of these predictors (all  $ps > .05$ ). These results thus suggest that inhibitory processes associated with obsessive passion are specific to alternative goals.

**Progressive unfamiliar goal suppression.** Additional analyses were conducted to determine the progressive inhibitory effect of the passionate activity on the *pleasant activity* (i.e., a positively valenced activity that has never been performed before by participants). HLM analyses were thus conducted to predict reaction times to the pleasant activity from harmonious and obsessive passion (between-person factors), prime categories (within-person factor), trial progression (within-person factor), and their interactions.

In our first analysis, trial progression was included as a continuous variable. Results showed that harmonious and obsessive passion did not predict reaction times (all  $ps > .05$ ). Results also showed that prime categories ( $B = -0.00, p = .25$ ) and trial progression ( $B = -0.00, p = .71$ ) did not predict reaction times to the pleasant activity. Furthermore, the results demonstrated that harmonious and obsessive passion did not significantly moderate prime categories, trial progression, or the “Prime Categories ×

<sup>3</sup> For exploratory purposes, we conducted additional analyses to examine the possible interaction effect of harmonious and obsessive passion. Across studies, the Harmonious × Obsessive Passion interaction was unrelated to the goal-shielding effect. Furthermore, in line with a method used by Higgins, Pierro, & Kruglanski (2008; see also Orehek et al., 2012), we replicated all results from Studies 1, 2, and 3 using difference scores (i.e., obsessive passion scores minus harmonious passion scores) that indicate participants' predominant type of passion. Results revealed that when we considered difference scores, all original effects remained significant or marginally significant, confirming that greater obsessive passion predicted greater goal-shielding.

Trial Progression" interaction term (all  $ps > .05$ ). Overall, these results did not support the hypothesis that repeated pairing of a passionate activity with an activity that has never been pursued before would lead to the development of inhibitory links between the two.

However, it could be that the absence of findings in the previous analysis is not because of an absence of effect but rather because trial progression was considered as a continuous predictor. Using a recall induced forgetting paradigm, Danner et al. (2007) found evidence that inhibition of alternative means depends on the retrieval frequency of the target means such that the greater the retrieval the greater the inhibition of competing means for a given goal. Importantly, inhibitory processes were shown to require sufficient repetition, and they only occurred with three trials or more (a single trial was found to be insufficient). Presumably this is because inhibitory links take time to develop and integrate in memory systems (Chan, Morell, Jarrard, & Davidson, 2001; Davidson, Kanoski, Walls, & Jarrard, 2005; Shah et al., 2002). In line with this reasoning, a different analytical strategy was utilized to examine the progressive inhibition of unfamiliar goal by dichotomizing trial progression to compare the first three trials to the last three trials.

Trial progression was thus dummy coded with a score of 1 attributed to the last three trials and a score of 0 attributed to the first three trials. This analysis yielded only two significant terms, everything else was statistically nonsignificant (see Table 2). Results showed that prime categories predicted reaction times to the pleasant activity ( $B = -0.01, p = .05$ ). Specifically, faster reaction times were observed on trials that exposed participants to their pleasant activity than on trials that exposed participants to a neutral word. More importantly, the within-person "Prime Categories  $\times$  Trial Progression" interaction was qualified by obsessive passion (i.e., "Obsessive Passion  $\times$  Prime Categories  $\times$  Trial Progression" interaction;  $B = 0.08, p = .04$ ). Specifically, the more people reported having an obsessive passion, the slower their reaction times to the pleasant activity in the last three trials, in comparison to the first three trials when primed with the passionate activity than when primed with a neutral word. Stated differently, the progressive inhibitory effect of the passionate activity on the pleasant activity was more pronounced with higher levels of obsessive passion.

Follow-up simple slope tests for the "Obsessive Passion  $\times$  Prime Categories  $\times$  Trial Progression" interaction showed that for individuals who were high (i.e., 1 standard deviation unit above the mean) on obsessive passion, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed in the last three trials ( $B = 0.04, t = 5.91, p = .00$ ). Moreover, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were accelerated in the first three trials ( $B = -0.05, t = 3.51, p = .00$ ). In contrast, for individuals who were low (i.e., 1 standard deviation unit below the mean) on obsessive passion, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were accelerated in the last three trials ( $B = -0.04, t = 4.04, p = .00$ ), whereas reaction times to the alternative goal were unaffected by prime categories in the first three trials ( $B = 0.01, t = 0.39, p = .70$ ).

Overall, the above results suggest that with high levels of obsessive passion, the repeated pairing of the passionate activity with an unfamiliar goal progressively leads the passionate activity to suppress the unfamiliar goal. However, the progressive inhibition of the unfamiliar goal takes time to develop and only becomes apparent after sufficient pairing of the activity and the unfamiliar goal. No such effects were found with harmonious passion.

## Discussion

Results from Study 1 provide initial evidence for the unconscious effect of goal-shielding, indicated by participants' slower reaction times to the alternative goal when primed with their passionate activity, as opposed to being primed with a neutral word. However, this effect did not occur for all passionate individuals. Indeed, our results reveal that higher levels of obsessive (but not harmonious) passion were associated with greater monopolization of attentional resources when the passionate activity's cognitive representation was unconsciously activated.

While conceptually replicating the work of Shah and colleagues (2002) on the potential of important goals to inhibit alternative goals, our results indicated that goal-commitment does not tell the whole story about alternative goal suppression and that not all important goals are created equal. Taken together, our results suggest that quality of goal engagement plays a fundamental role

Table 2

*Results of the HLM Analysis Predicting Reaction Times to the Pleasant Activity From Harmonious and Obsessive Passion, Prime Categories, and Trial Progression (Log ms): Study 1*

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion	0.00	0.76	.45
Obsessive passion	0.01	0.61	.54
Prime categories	-0.01	-2.00	.05
Trials progression	-0.01	-1.63	.11
Harmonious Passion $\times$ Prime Categories	0.00	1.15	.25
Obsessive Passion $\times$ Prime Categories	-0.01	-0.84	.40
Harmonious Passion $\times$ Trial Progression	0.00	1.07	.29
Obsessive Passion $\times$ Trial Progression	-0.01	-1.47	.15
Prime Categories $\times$ Trial Progression	0.04	1.81	.07
Harmonious Passion $\times$ Prime Categories $\times$ Trial Progression	-0.02	-1.35	.18
Obsessive Passion $\times$ Prime Categories $\times$ Trial Progression	0.08	2.10	.04

Note.  $N = 31$ . HLM = hierarchical linear modeling.

in determining the extent to which alternative goals are suppressed. Accordingly, activity engagement related to goal-conflicts (i.e., obsessive passion) accentuates alternative goal suppression, whereas activity engagement unrelated to goal-conflict is not associated with the suppression of alternative goals.

In addition, our results provide empirical support for Shah et al.'s (2002) theoretical proposition that goal-shielding is a learned self-regulatory strategy. We found that pairing a passionate activity with a new goal progressively leads to the development of inhibitory links between the two such that, over time, activating the passionate activity leads to the suppression of the new goal. Interestingly, these effects occur only as a function of how poorly the passionate activity is regulated with other goals. Indeed, only obsessive (but not harmonious) passion was shown to predict the progressive inhibition of the new goal. It is also interesting to note that these inhibitory effects were preceded by a period of facilitation (on the first three trials), where the passionate activity (as opposed to a neutral prime) accelerated responses to the pleasant activity. We posit that this effect is likely due to the positive valence of the prime (i.e., the passionate activity) and the target (i.e., participants' pleasant activity). In other words, activating a positively valenced construct may facilitate responses to another positively valenced construct. In sum, results of Study 1 illustrate the process through which obsessive passion fosters the monopolization of attentional resources.

## Study 2

In Study 1, we found that the construct of passion, which reflects the *quality* of goal engagement among highly committed individuals, is a moderator of alternative goal suppression. Specifically, higher levels of obsessive (but not of harmonious) passion were associated with greater inhibition of alternative goals. One alternative explanation of this finding is that greater levels of obsessive passion may reflect greater goal-commitment than harmonious passion and thus lead to greater goal-shielding. Indeed, there is precedent in the goal-shielding literature suggesting that goal-commitment is related to greater goal-shielding effects (Shah et al., 2002). In Study 2, we address this alternative explanation by assessing participants' commitment to their passionate activity. We argue that it is not the magnitude of goal-commitment that differentiates obsessive from harmonious passion but rather, the quality of goal engagement (i.e., the type of passion). Consequently, we predicted that obsessive and harmonious passion would be equally (and positively) related to goal-commitment.

In addition to ruling out this alternative explanation, we aimed to provide empirical evidence that the magnitude of goal-commitment is conceptually different from the quality of goal engagement and that, in fact, these two dimensions could interact and provide novel insights into the goal-shielding phenomenon. Consistent with previous findings, we predicted that important goals would utilize more attentional resources and thereby enhance the inhibition of alternative goals (Shah et al., 2002). However, we predicted that the moderating effect of goal-commitment would not occur in all circumstances. Presumably, highly important goals that are well-integrated with other life domains do not compete for attentional resources as much as goals that are poorly integrated and chronically in conflict with other goals. Therefore, we hypothesized that goal-commitment would only magnify existing

intergoal inhibitory links (associated with obsessive, but not harmonious, passion). In other words, obsessive passion and goal-commitment were expected to interact in their effect on alternative goal suppression. No such interaction was expected with harmonious passion.

## Method

**Participants.** One hundred fourteen University of Maryland undergraduate psychology students (63 women, 51 men;  $M_{\text{age}} = 19.54$  years,  $SD_{\text{age}} = 2.67$  years) participated in exchange for monetary payment.

**Procedure and measures.** In a private room, participants were asked to "determine an activity that you like, that is important to you, and in which you invest a significant amount of time on a regular basis," then participants completed the Passion Scale (Vallerand et al., 2003). Internal consistency indices of .79 and .84 were obtained for the harmonious ( $M = 5.20$ ,  $SD = 1.09$ ) and obsessive ( $M = 2.91$ ,  $SD = 1.35$ ) passion subscales, respectively. Then, participants' commitment to their activity was measured by asking them to rate the extent to which their activity was important ( $M = 6.15$ ,  $SD = 1.17$ ) on a 7-point scale ranging from 1 (*not important at all*) to 7 (*extremely important*). Following this measure, participants mentioned a second important activity. Then they performed a lexical decision task that was similar in all respects to Study 1, the only difference being that the "pleasant activity" of Study 1 was removed from the task. A funneled debriefing procedure (Chartrand & Bargh, 1996) was used at the end of the experiment to assess whether participants had guessed the nature of the study or had seen the subliminal primes. No participant reported any suspicion about the study or reported seeing the primes after having been told that they were presented on the screen.

## Results

**Preliminary analyses.** As in Study 1, participants' incorrect responses were removed. Then, reaction times were transformed using a natural log transformation to lessen the influence of outliers and were then excluded if they exceeded more than 3 standard deviations from the mean (Bargh & Chartrand, 2000; Fazio, 1990). Corresponding response times were then averaged.

To determine whether harmonious and obsessive passion were equally related to goal-commitment, harmonious and obsessive passion were both correlated with goal importance. Results indicated that both harmonious,  $r(112) = .41$ ,  $p = .001$ , and obsessive passion,  $r(112) = .19$ ,  $p = .04$ , were significantly and positively related to goal-commitment. We extended these analyses by addressing whether these two correlations significantly differed from one another; Hotelling's  $t$  test procedure indicated that correlations coefficients were not different,  $t(111) = 1.89$ ,  $p > .05$ .

**Main analyses.** HLM analyses were conducted to predict reactions times to the alternative goal from harmonious and obsessive passion (between-person factors), goal-commitment (between-person factor), prime categories (within-person factor), and their interactions. Results (see Table 3) showed that harmonious and obsessive passion, goal-commitment, prime categories, and all interactions but two (i.e., "Harmonious Passion  $\times$  Goal-Commitment" and "Obsessive Passion  $\times$  Goal-Commitment  $\times$



Table 3  
*Results of the HLM Analysis Predicting Reaction Times to the Alternative Goal From  
Harmonious and Obsessive Passion, Goal-Commitment, and Prime Categories (Log ms): Study 2*

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion	−0.01	−1.92	.06
Obsessive passion	−0.01	−1.28	.21
Goal-commitment	−0.00	−0.18	.86
Prime categories	0.00	0.00	.99
Harmonious Passion × Goal Commitment	−0.01	−2.34	.02
Obsessive Passion × Goal Commitment	0.00	0.29	.77
Harmonious Passion × Prime Categories	−0.01	−1.88	.06
Obsessive Passion × Prime Categories	0.01	0.29	.77
Goal Commitment × Prime Categories	.01	1.38	.17
Harmonious Passion × Goal Commitment × Prime Categories	−0.00	−0.92	.26
Obsessive Passion × Goal Commitment × Prime Categories	0.01	2.34	.02

Note. *N* = 114. HLM = hierarchical linear modeling.

Prime Categories” interactions) did not predict reaction times (all  $ps > .05$ ). However, results revealed that the “Harmonious Passion × Goal-Commitment” interaction predicted mean levels of reaction times ( $B = -0.01$ ,  $p = .02$ ), suggesting that individuals high on both harmonious passion and goal-commitment had faster reaction times to the alternative goal independently of whether the prime was the passionate activity or a neutral word. In addition, consistent with our hypotheses, results revealed that the within-person relationship between prime categories and reaction times was moderated by the “Obsessive Passion × Goal-Commitment” interaction (i.e., “Obsessive Passion × Goal-Commitment × Prime Categories” interaction;  $B = 0.01$ ,  $p = .02$ ).

Follow-up simple slope tests (Aiken & West, 1991) for the “Obsessive Passion × Goal-Commitment × Prime Categories” interaction showed that for individuals who were high (i.e., 1 standard deviation unit above the mean) on both obsessive passion and goal-commitment, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed ( $B = 0.05$ ,  $t = 3.19$ ,  $p = .00$ ). Moreover, for individuals who were low (i.e., 1 standard deviation unit below the mean) on obsessive passion but high on goal-commitment, reaction times to the alternative goal were unaffected by prime categories ( $B = -0.02$ ,  $t = 1.36$ ,  $p = .18$ ). In addition, for individuals who were high on obsessive passion but low on goal-commitment, reaction times to the alternative goal were accelerated by prime categories ( $B = -0.03$ ,  $t = -2.06$ ,  $p = .05$ ). Finally, for individuals who were low on both obsessive passion and goal-commitment, reaction times to the alternative goal were unaffected by prime categories ( $B = 0.00$ ,  $t = 0.09$ ,  $p = .93$ ). In sum, as expected, goal-commitment exacerbated the inhibitory effect of obsessive passion on the alternative goal.

## Discussion

Study 2 sought to replicate the findings of Study 1 while addressing the alternative explanation that obsessive passion (as opposed to harmonious passion) is associated with greater commitment to the activity, producing a correspondingly greater suppression of alternative goals. Our results suggest that this is not the case, as harmonious and obsessive passion were both positively associated with a measure of goal-commitment. Moreover, the

magnitude of goal-commitment did not differ between types of passion. If anything, the relationship between goal-commitment and harmonious passion was stronger than the one with obsessive passion. Thus, these results support our argument that the difference between harmonious and obsessive passion is qualitative (rather than quantitative) and refers to how the passionate activity is experienced and regulated across life domains.

Furthermore, the results of Study 2 provide evidence that goal-commitment influences goal-shielding. These results therefore appear consistent with Shah and colleagues’ (2002) findings that goal-commitment intensifies alternative goal suppression. We extend these findings by revealing that the role of goal-commitment needs to be understood in relation to *quality* of goal engagement. Indeed, the influence of goal-commitment on goal-shielding was observable only with regard to activities poorly regulated with other life domains and not for well-integrated activities. In accordance with our predictions, quality of goal engagement and goal-commitment interacted and led to greater goal-shielding for individuals with high levels of obsessive passion (when the activity was highly important). No such interaction was found with harmonious passion. Thus, the present results support the contention that goal-commitment only strengthens existing inhibitory links among goals associated with conflict (as opposed to well integrated) with other life domains.

## Study 3

The results of Studies 1 and 2 indicated that obsessive (but not harmonious) passion was associated with greater goal-shielding. However, the correlational nature of Studies 1 and 2 affords the possibility that the results might have been affected by extraneous variables and limits the use of causal inferences concerning the role of passion types in goal-shielding. To tackle these issues, Study 3 replicated Study 1 using an experimental design intended to provide clearer evidence concerning the moderating effect of the types of passion on goal-shielding. To this end, Study 3 included a situational manipulation of passion. This methodology entails inducing an obsessive or harmonious passion mindset by asking participants to write a short essay about a personal experience in which they acted in a prototypical obsessive or harmonious way. Similar recall manipulations have proved to be effective in acti-

vating specific psychological constructs, such as different regulatory focus modes (Avnet & Higgins, 2003; Pierro et al., 2008). We expected to conceptually replicate the results of Studies 1 and 2 and predicted that participants in the *obsessive passion condition* would suppress alternative goals to a greater extent than individuals in the *harmonious passion condition*. Furthermore, we expected participants in the *neutral condition* to demonstrate goal-shielding patterns similar to their chronic dispositional passion (assessed by the Passion Scale, administered after the lexical decision task), hence replicating Study 1's results (greater levels of obsessive passion would be associated with greater magnitude of goal-shielding).

## Method

**Participants.** Seventy University of Maryland undergraduate psychology students (43 women, 27 men;  $M_{\text{age}} = 19.26$  years,  $SD_{\text{age}} = 1.15$  years) participated in the study in exchange for monetary payment.

**Procedure and measures.** Participants were invited for a study pertaining to activity preferences. In a private room, they were asked to "determine an activity that you like, that is important to you, and in which you invest a significant amount of time on a regular basis." Subsequently, the experimenter informed the participants that they would engage in a writing task for a period of 5 min. Participants were randomly assigned to one of three writing tasks that differentiated the experimental conditions from each other. In the *harmonious passion condition*, participants were instructed to

Write about a time when your favorite activity was in harmony with other things that are part of you and you felt that your favorite activity allowed you to live a variety of experiences. Recall this event vividly and include as much details as you can to relive the experience.

These instructions were based on the following two items of the harmonious passion subscale, namely, (a) "My activity is in harmony with other things that are part of me," and (b) "My activity allows me to live a variety of experiences."

Participants in the obsessive passion condition were assigned to a similar writing task but were instructed to

Write about a time where you had difficulties controlling your urge to do your favorite activity and you felt that your activity was the only thing that really turned you on. Recall this event vividly and include as much details as you can to relive the experience.

These instructions were based on the following two obsessive passion subscale items: (a) "I have difficulties controlling my urge to do my activity"; and (b) "This activity is the only thing that really turns me on."

Finally, in the control condition, participants were instructed to

Write about a time when you had to borrow a book at the library. Recall this event vividly and include as much details as you can to relive the experience.

After the 5-min period, the experimenter collected the essays and distributed a different questionnaire packet. As in Studies 1 and 2, participants then indicated a second important activity. Goal-shielding was measured using a lexical decision task identical to that used in Study 2. Following the lexical decision task, participants in the *neutral condition* were given the Passion Scale. Reliability of the harmonious ( $M = 5.31$ ,  $SD = 0.96$ ) and obsessive ( $M = 2.46$ ,  $SD = 1.17$ ) passion subscales yielded internal consistency indices of .81 and .84, respectively. A funneled debriefing procedure (Chartrand & Bargh, 1996) was used to assess whether participants had guessed the nature of the study or whether they had seen the subliminal primes. No participant reported any suspicion about the study or reported seeing the primes after having been told that they were presented on the screen.

## Results

**Preliminary analyses.** As in Studies 1 and 2, incorrect responses to the lexical decision task were removed. Participants' reaction times were then log transformed to lessen the influence of outliers and were excluded if they exceeded more than 3 standard deviations from the mean. Corresponding response times were averaged.

**Main analyses.** HLM analyses were conducted to predict reactions times to the alternative goal from experimental conditions (between-person factors), prime categories (within-person factor), and their interactions. Consequently, experimental conditions were integrated to the analysis using two dummy variables. The *harmonious passion condition* was dummy coded as 1 on the first dummy variable, and the *obsessive passion condition* was coded as 1 on the second dummy variable, thus leaving the *control condition* as the reference group in the analysis. Results (see Table 4) showed that harmonious and obsessive passion did not predict reaction times (all  $ps > .05$ ). However, replicating results from Study 1, results showed that prime categories predicted reaction times to the alternative goal ( $B = 0.03$ ,  $p = .00$ ). Specifically,

Table 4  
Results of the HLM Analysis Predicting Reaction Times to the Alternative Goal From Experimental Conditions and Prime Categories (Log ms): Study 3

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion vs. control	−0.02	−0.95	.34
Obsessive passion vs. control	−0.03	−1.57	.12
Prime categories	0.03	3.98	.00
Harmonious Passion vs. Control × Prime Categories	−0.01	−0.05	.96
Obsessive Passion vs. Control × Prime Categories	0.04	1.96	.05

Note.  $N = 70$ . HLM = hierarchical linear modeling.

slower reaction times were observed on trials that exposed participants to their passionate activity than on trials that exposed participants to a neutral word. Furthermore, in accordance with our hypotheses, results revealed that the within-person relationship between prime categories and reaction times was moderated by obsessive passion versus control condition dummy variable (i.e., "Obsessive Passion vs. Control  $\times$  Prime Categories" interaction;  $B = 0.04, p = .05$ ).

Follow-up HLM analyses showed that for individuals in the obsessive passion condition, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed ( $B = 0.07, t = 7.11, p = .00$ ). In addition, for individuals in the control condition, reaction times to the alternative goal were slowed by prime categories ( $B = 0.03, t = 3.07, p = .00$ ). Furthermore, we extended these analyses by addressing whether the within-person relationship between prime categories and reaction times differed across conditions. Results revealed that the within-person relationship between prime categories and reaction times was significantly higher in the obsessive passion condition than in the control condition ( $t = 4.19, p = .00$ ). Stated differently, the inhibitory effect of the passionate activity on the alternative goal was stronger in the obsessive passion condition than in the neutral condition.

**Auxiliary analyses.** Additional HLM analyses were conducted to compare reaction times to the alternative goal between harmonious and obsessive passion (between factor) and prime categories (within-person factor). The harmonious passion condition was dummy coded as 0, and the obsessive passion condition was coded as 1. Results revealed that in comparison to participants in the harmonious passion condition, participants in the obsessive passion condition had slower reaction times to the alternative goal when primed with the passionate activity than when primed with neutral words ( $B = 0.04, p = .05$ ).

Follow-up HLM analyses showed that for individuals in the obsessive passion condition, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed ( $B = 0.07, t = 7.11, p = .00$ ). Moreover, for individuals in the harmonious passion condition, reaction times to the alternative goal were marginally slowed by prime categories ( $B = 0.02, t = 2.00, p = .06$ ). Furthermore, we extended these analyses by addressing whether the within-person relationship between prime categories and reaction times differed across conditions. Results revealed that the within-person relationship between prime categories and reaction times was significantly higher in the obsessive passion condition than in the harmonious passion ( $t = 5.24, p = .00$ ). Overall, these results reveal that thinking in an obsessively passionate way (as opposed to harmoniously) about an activity is conducive to greater automatic inhibition of alternative goals.

Finally, in the control condition, we predicted that reaction times to the alternative goal would be predicted by participants' self-report measure of obsessive passion as in Study 1. As expected, results revealed that obsessive passion ( $B = 0.04, p < .05$ ) moderated the within-person relation between reaction times and prime categories. Replicating the findings of Study 1, obsessive (but not harmonious) passion was positively related to slower reaction times to the alternative goal when participants' passionate activities were primed, as opposed to when neutral words were primed.

## Discussion

Study 3 manipulated individuals' type of passion and replicated as well as extended Study 1's results by demonstrating the causal link between passion-type and goal-shielding. Results indicated that individuals in an obsessive passion mindset suppressed alternative goals to a greater extent than individuals in a harmonious passion mindset. This suggests that mindsets that focus on goal-conflict (i.e., "difficulties controlling your urge to do your favorite activity"), such as the obsessive passion mindset, promote the suppression of alternative goals to a greater extent than mindsets that focus on goal-integration (i.e., "My activity is in harmony with other things that are part of me") such as the harmonious passion mindset. By shaping participants' reaction times through a manipulation of passion, we also provide empirical support for the conceptualization of passion as a dynamic construct influenced by situational factors. These results are consistent with the notion that psychological constructs can be alternatively operationalized either as individual differences or as expressions of situational forces (Higgins, 1998; Kruglanski & Sheveland, in press). Indeed, obsessive passion measured by the passion scale in the present research also led to alternative goal suppression, mirroring the effect of the obsessive passion manipulation.

Although the present findings support the contention that quality of goal engagement has direct bearing on alternative goals' suppression, they may appear somewhat contradictory with goal-shielding theory. Consistent with seminal work on goal-shielding (Shah et al., 2002), we have posited and found evidence in Study 1 that goal-shielding results from repeated attempts to suppress alternative goals and therefore that it requires a certain period of practice before becoming routinized and automatic. Yet, our findings demonstrate that goal-shielding is accentuated when individuals are situationally primed with an obsessive passion mindset.

## Study 4

How could it be that a situational manipulation influences what is learned over time through extensive repetition? The purpose of Study 4 was to provide an answer to this question by investigating how intergoal inhibitory links develop. In Study 1, we found that obsessive passion (associated with goal-conflict) was associated with the progressive development of intergoal inhibitory links. Consistent with these findings, we predicted that experimentally inducing an obsessive mindset, which focuses on conflict, should foster the creation of intergoal inhibitory links after several pairings of the passionate activity with a new goal. Whereas in Study 1, we demonstrated that this learned process occurred on self-generated activities that participants reported never to have performed before (*pleasant activity*), in Study 4, we imposed such an activity onto participants while ensuring they had never done this activity beforehand. Such precaution was taken because it could be argued that individuals in an obsessive (conflict-related) mindset would be more prone to elicit an alternative activity already in conflict with their passion. By embedding a new activity that participants did not generate themselves (skydiving) in the lexical decision task, we circumvented this issue, aiming to gain a clearer picture of how inhibitory links develop between activities.

In addition, Study 4 investigated a possible confound in our previous studies. As described previously, the construct of passion

shows similarities with the concept of intrinsic motivation, as both involve interest in and liking of an activity. Despite the fact that previous research has shown passion to be a distinct motivational construct (see Vallerand et al., 2003, Study 2; Vallerand, 2010), intrinsic and extrinsic motivation have never been examined in the context of goal-shielding. Therefore, we aimed to rule out this potential confound by including a measure of intrinsic and extrinsic motivation. Intrinsic and extrinsic motivations were predicted to have no bearing on goal-shielding, and it was predicted that only obsessive passion would be associated with goal-shielding, hence replicating previous studies.

## Method

**Participants.** Forty-eight University of Maryland undergraduate psychology students (32 women, 16 men;  $M_{\text{age}} = 20.17$  years,  $SD_{\text{age}} = 3.69$  years) participated in the study in exchange for monetary payment.

**Procedure and measures.** Participants were invited to participate in a study on activity preferences. In a private room, participants were asked to “determine an activity that you like, that is important to you, and in which you invest a significant amount of time on a regular basis.” In order to rule out the possibility that goal-shielding effects were not due to passion but to intrinsic and extrinsic motivation, participants’ motivation toward their passionate activity was assessed with the Situational Motivation Scale (SIMS; Guay, Vallerand, & Blanchard, 2000). The SIMS measures four types of motivation to engage in an activity with four items per subscale: intrinsic motivation (e.g., “Because I think that this activity is interesting”), identified regulation (e.g., “Because I am doing it for my own good”), external regulation (e.g., “Because I am supposed to do it”), and amotivation (e.g., “There may be good reasons to do this activity, but personally I don’t see any”). Internal consistency indices ranged from .71 to .83. In line with past research (see Vallerand, 1997), we computed a self-determined motivation index ( $M = 3.50$ ,  $SD = 1.25$ ) by averaging the intrinsic motivation and identified regulation items ( $\alpha = .85$ ) and a non-self-determined motivation index ( $M = 2.70$ ,  $SD = 1.03$ ) by averaging the external regulation and amotivation items ( $\alpha = .76$ ).

Subsequently, the experimenter informed the participants that they would engage in a writing task for a period of 5 min. Participants were randomly assigned to one of two writing tasks that differentiated the experimental conditions (i.e., harmonious and obsessive passion conditions). The writing tasks were identical to those in Study 3. As a manipulation check, participants were given one item from the harmonious (i.e., “My activity is in harmony with other activities in my life.”) and obsessive passion (i.e., “I have the impression that my activity controls me”) subscales of the Passion Scale after the lexical decision task.

After the 5-min writing period, the experimenter collected the essays and distributed a different questionnaire packet. As in our previous studies, participants indicated a second important activity. Goal-shielding was then measured using a lexical decision task identical to that used in Studies 2 and 3, with the exception that the *unfamiliar goal* of skydiving was included. This goal served as a stimulus with which individuals had very little personal experience. Indeed, only three participants reported having done this

activity once, whereas the other 45 participants reported that they have never engaged in such activity.<sup>4</sup>

A funneled debriefing procedure (Chartrand & Bargh, 1996) was used to assess whether participants had guessed the nature of the study or whether they had seen the subliminal primes. No participant reported any suspicion about the study or reported seeing the primes after having been told that they were presented on the screen.

## Results

**Preliminary analyses.** Similar to all previous studies, incorrect responses to the lexical decision task were removed. Participants’ reaction times were then log transformed to lessen the influence of outliers and were excluded if they exceeded more than 3 standard deviations from the mean. Corresponding response times were averaged.

**Manipulation check.** To confirm that the two conditions operated as intended, we conducted a multivariate analysis of variance, with the harmonious and obsessive passion items as the dependent measures. The main effect for harmonious passion was marginally significant,  $F(1, 46) = 3.51$ ,  $p = .06$ , indicating that harmonious passion was higher in the harmonious passion condition ( $M = 5.00$ ,  $SD = 1.15$ ) than in the obsessive passion condition ( $M = 4.35$ ,  $SD = 1.23$ ). In addition, the main effect for obsessive passion was also marginally significant,  $F(1, 46) = 3.16$ ,  $p = .08$ , indicating that obsessive passion was higher in the obsessive passion condition ( $M = 3.90$ ,  $SD = 1.94$ ) than in the harmonious passion condition ( $M = 2.96$ ,  $SD = 1.69$ ). Thus, the manipulation of passion was effective.

### Main analyses.

**Alternative goal suppression.** HLM analyses were conducted to predict reaction times to the alternative goal from experimental conditions (between-person factors), self-determined and non-self-determined motivation (between-person factors), prime categories (within-person factor), and their interactions. Consequently, experimental conditions were dummy coded with a score of 1 in the *obsessive passion condition* and a score of 0 in the *harmonious passion condition*. Results (see Table 5) showed that experimental conditions, self-determined and non-self-determined motivation, prime categories, and all interactions but one (i.e., “Harmonious Passion vs. Obsessive Passion  $\times$  Prime Categories” interactions) did not predict reaction times (all  $ps > .05$ ). However, in accordance with our hypotheses, results revealed that the within-person relationship between prime categories and reaction times was marginally moderated by experimental conditions (i.e., “Harmonious Passion vs. Obsessive Passion  $\times$  Prime Categories” interaction;  $B = 0.04$ ,  $p = .06$ ).

Follow-up HLM analyses for the “Harmonious Passion vs. Obsessive Passion  $\times$  Prime Categories” interaction showed that for individuals in the obsessive passion condition, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed ( $B = 0.04$ ,  $t = 3.56$ ,  $p = .00$ ). In contrast, for individuals in the harmonious passion condition, reaction times to the alternative goal were unaffected by

<sup>4</sup> Removing these three participants from the analyses did not change the statistical results, therefore these participants were kept in the present sample.



Table 5  
*Results of the HLM Analysis Predicting Reaction Times to the Alternative Goal From Experimental Conditions, Self-Determined and Non-Self-Determined Motivation, and Prime Categories (Log ms): Study 4*

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion vs. obsessive passion	0.03	1.46	.15
Self-determined motivation	−0.01	−0.37	.71
Non-self-determined motivation	0.01	1.72	.09
Prime categories	0.00	0.03	.97
Harmonious Passion vs. Obsessive Passion × Prime Categories	0.04	1.91	.06
Self-Determined Motivation × Prime Categories	−0.00	−0.30	.76
Non-Self-Determined Motivation × Prime Categories	−0.00	−0.12	.91

Note. *N* = 48. HLM = hierarchical linear modeling.

prime categories ( $B = 0.00$ ,  $t = 0.01$ ,  $p = .99$ ). In sum, the inhibitory effect of the passionate activity on the alternative goal was stronger in the obsessive passion condition than in the harmonious passion condition.

**Progressive unfamiliar goal suppression.** Similar to Study 1, additional analyses were conducted to determine the progressive inhibitory effect of the passionate activity on the *pleasant activity* (i.e., a positively valenced activity that has never been performed before by participants). In the present Study, this activity was *skydiving* for all participants. HLM analyses were thus conducted to predict reactions times to the pleasant activity from experimental conditions (between-person factors), self-determined and non-self-determined motivation (between-person factors), prime categories (within-person factor), trial progression (within-person factor), and their interactions.

In order to replicate the results from Study 1, we first investigated the progressive inhibition of unfamiliar goals using trial progression as a continuous predictor. Results showed that the experimental conditions, self-determined and non-self-determined motivation, and prime categories did not predict reaction times (all  $ps > .05$ ). Trial progression was negatively associated reaction times such that later trials were responded to faster than early trials ( $B = -0.01$ ,  $p = .03$ ). Furthermore, the results demonstrated that experimental conditions, self-determined and non-self-determined motivation did not significantly moderate prime categories, trial progression, or the “Prime Categories × Trial Progression” interaction term (all  $ps > .05$ ). Overall, these results did not show support for the hypothesis that repeated pairing of a passionate activity with an activity that has never been pursued before would lead to the development of inhibitory links between the two.

However, in line with Study 1’s analyses, we dichotomized the trial progression variable such that we could compare the first three trials to the last three trials. This was to test the notion that the inhibitory links take time to develop and integrate into memory systems (Chan et al., 2001; Davidson et al., 2005; Shah et al., 2002). Consequently, trial progression was dummy coded with a score of 1 attributed to the last three trials and a score of 0 attributed to the first three trials. Results (see Table 6) showed that that experimental conditions, self-determined and non-self-determined motivation, prime categories, and all interactions but two (i.e., “Prime Categories × Trial Progression” and “Harmonious Passion vs. Obsessive Passion × Prime Categories × Trial Progression” interactions) did not predict reaction times (all  $ps >$

.05). However, results showed that trial progression (i.e., first three vs. last three trials) predicted reaction times ( $B = -0.02$ ,  $p = .00$ ). Results revealed that participants had faster reaction times in the last three trials compared to the first three trials. In addition, results revealed that the within-person relationship between trial progression and reaction times was marginally moderated by prime categories (i.e., “Prime Categories × Trial Progression” interaction;  $B = 0.01$ ,  $p = .06$ ). More importantly, the within-person “Prime Categories × Trial Progression” interaction was qualified by experimental conditions (i.e., “Harmonious Passion vs. obsessive Passion × Prime Categories × Trials Progression” interaction;  $B = 0.02$ ,  $p = .03$ ).

Follow-up HLM analyses for the “Harmonious Passion versus Obsessive Passion × Prime Categories × Trial Progression” interaction showed that for individuals in the obsessive passion condition, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were slowed in the last three trials ( $B = 0.03$ ,  $t = 3.99$ ,  $p = .00$ ). Moreover, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were accelerated in the first three trials ( $B = -0.02$ ,  $t = 2.98$ ,  $p = .00$ ). In contrast, for individuals in the harmonious passion condition, reaction times to the alternative goal when primed with their passionate activity (as opposed to a neutral prime) were unaffected in the last three trials ( $B = 0.01$ ,  $t = 0.93$ ,  $p = .36$ ) and in the first three trials ( $B = -0.01$ ,  $t = 1.35$ ,  $p = .18$ ). Overall, the above results suggest that in the obsessive passion condition, the repeated pairing of the passionate activity with an unfamiliar goal progressively leads the passionate activity to suppress the unfamiliar goal. However, the progression inhibition of an unfamiliar goal takes time to develop and is only apparent after sufficient pairing of the (conflicting) activity and the unfamiliar goal.

## Discussion

Study 4 provides results consistent with those of Study 3 and illustrates how harmonious and obsessive passion mindsets differentially affect individuals’ responses to alternative goals. Specifically, Study 4 replicated prior findings that mindsets that focus on goal-integration (i.e., the harmonious passion mindset) are not conducive to goal-shielding, whereas mindsets that focus on goal-conflict (i.e., the obsessive passion mindset), trigger the shielding of one’s focal goal from alternative considerations. In addition,

Table 6

*Results of the HLM Analysis Predicting Reaction Times to the Alternative Goal From Experimental Conditions, Self-Determined and Non-Self-Determined Motivation, Prime Categories, and Trial Progression (Log ms): Study 4*

Predictors	Coefficient	<i>t</i> ratio	<i>p</i> value
Harmonious passion vs. obsessive passion	0.04	1.76	.09
Self-determined motivation	0.00	1.12	.27
Non-self-determined motivation	0.01	1.26	.22
Prime categories	−0.00	−0.24	.82
Trials progression	−0.02	−3.09	.00
Harmonious Passion vs. Obsessive Passion × Prime Categories	0.01	0.81	.42
Self-Determined Motivation × Prime Categories	0.00	0.04	.97
Non-Self-Determined Motivation × Prime Categories	−0.00	−1.32	.20
Harmonious Passion vs. Obsessive Passion × Trial Progression	−0.00	−0.03	.98
Self-Determined Motivation × Trial Progression	−0.00	−0.24	.81
Non-Self-Determined Motivation × Trial Progression	0.00	0.75	.46
Prime Categories × Trial Progression	0.01	1.90	.06
Harmonious Passion vs. Obsessive Passion × Prime Categories × Trial Progression	0.02	2.22	.03
Self-Determined Motivation × Prime Categories × Trial Progression	0.00	0.01	.99
Non-Self-Determined Motivation × Prime Categories × Trial Progression	−0.00	−0.47	.64

*Note.* *N* = 48. HLM = hierarchical linear modeling.

Study 4 illuminates the process through which the obsessive passion mindset influences alternative goal suppression: Under an obsessive passion mindset, the passionate activity progressively develops inhibitory links with alternative goals that subsequently lead to the suppression of goals that were not inhibited before. As the results attest, these inhibitory links take a short period of time to develop, and after repeated pairing of a passionate activity with a new goal, they become sufficiently strong to inhibit the novel goal. Akin to Study 1, these inhibitory effects were preceded by a period of facilitation: The unfamiliar goal (i.e., skydiving) was recognized faster (on the first three trials) when the prime was the passionate activity (as opposed to a neutral word). As discussed in Study 1, this facilitation effect is probably due to the positive valence of both goals.

Overall, our results thus far are consistent with the notion that obsessive—but not harmonious—passion restrains attentional focus on the passionate activity by suppressing alternative goals that vie for consideration. This phenomenon occurs because obsessive passion is related to conflict and thus promotes the development of inhibitory links with other goals. These findings bring to the fore the question of what could be the consequences of overusing this self-regulatory strategy. Study 5 focused on this question.

### Study 5

In Study 5, we sought to extend the findings of the preceding studies by investigating the consequences of continuously suppressing alternative goals on future self-regulatory performance. Several authors have suggested that successful goal-striving is a function of efficient inhibition of internal and external distracters (Nigg, 2000; Shah et al., 2002). While this appears to be the case, reliance on such single track self-regulatory strategies have been shown to incur a psychological cost. Research inspired by the strength model of self-regulation (Baumeister, Vohs, & Tice,

2007; Muraven & Baumeister, 2000), for instance, has suggested that self-regulatory strategies may draw on a limited resource pool, which may reduce available resources and impair subsequent self-regulatory efforts. This draining of self-regulatory resources might apply to unconscious goal-shielding as well. Although contemporary social cognition research often assumes that nonconscious processes do not consume many limited attentional resources (Bargh, 1994), we hypothesized that profuse instances of alternative goal inhibition could exact a price on individuals' self-regulatory resources. Indeed, "limited attentional resources" does not mean complete emancipation from energetic demands. Several pieces of evidence point to this proposition.

Recently, Kruglanski and colleagues (2012) have proposed a theoretical framework of motivated cognition which puts cognitive resources at the heart of goal-directed processes and affords integrative insights into a broad variety of social cognitive phenomena (e.g., persuasion, attribution, heuristics and biases, and motivated reasoning). Building on Kurt Lewin's (1936, 1951) field theoretic approach, cognitive energetics theory (CET) posits the existence of "a *driving force* set to bring about a given cognitive activity and a *restraining force* set to prevent it" (Kruglanski et al., 2012, p. 4). According to this framework, for a goal to succeed, sufficient cognitive resources and goal importance need to contribute to the driving force in order to outmatch the magnitude of the restraining force. Part of this model suggests that alternative goals contribute to the restraining force by interfering with individuals' focal goals (Shah et al., 2002) and by restraining the range of means available for goal-pursuit (Köpetz, Faber, Fishbach, & Kruglanski, 2011). Thus, CET postulates that inhibition of alternative goals is contingent upon sufficient driving force. Furthermore, consistent with other findings in social cognition, CET assumes that sufficient cognitive resources are necessary even for unconsciously pursued goals. Indeed, several independent streams of research suggest that

cognitive resources are necessary for unconscious goal pursuit in order to keep the focal goal active and monitor the environment for new opportunities (Fishbach et al., 2003; Hassin, Aarts, Eitam, & Custers, 2005; Papiés & Aarts, 2010).

Other empirical evidence in social cognition also suggests that unconscious self-regulation may hamper subsequent self-regulatory performance. For instance, in their work on the regulatory functions of goal-shielding, Shah and colleagues (2002) demonstrated that goal achievement was positively related to the extent to which people successfully shielded their goals from other competing goals. In contrast, subsequent studies revealed a decline in performance for the inhibited goal, which suggests that goal-shielding may have drawn resources away from the goal and consumed mental resources.

From a different perspective, recent neurocognitive accounts suggest that brain regions associated with voluntary control, such as the dorsal medial frontal cortex, may be similar to those crucial for implementing automatic inhibition (Sumner et al., 2007). The evidence suggesting that unconscious and volitional inhibition use similar processes and hardware therefore raises the question of whether they might also draw on similar mental resources. Study 5 tested this hypothesis by investigating whether unconscious goal-shielding may come at the expense of self-regulatory resources, undermining subsequent self-regulatory efforts. Building upon our previous findings that obsessive passion is associated with greater goal-shielding, we predicted that given numerous opportunities to goal-shield (as compared to very few), individuals with high levels of obsessive passion would deplete their self-regulatory resources through unconscious efforts to suppress alternative goals. In turn, this would then impair their subsequent self-regulatory performance. On the other hand, harmonious passion being unrelated to goal-shielding, it should not be associated with an impairment of subsequent self-regulatory attempts.

## Method

**Participants.** Sixty-seven University of Maryland undergraduate psychology students (40 women, 27 men;  $M_{\text{age}} = 21.26$  years,  $SD_{\text{age}} = 2.40$  years) participated in this study in exchange for monetary payment.

**Procedure and measures.** In a private room, participants were asked to “determine an activity that you like, that is important to you, and in which you invest a significant amount of time on a regular basis.” Participants then completed the Passion scale and indicated a second important activity. The harmonious ( $M = 5.43$ ,  $SD = 0.93$ ) and obsessive ( $M = 2.91$ ,  $SD = 1.28$ ) passion scales yielded internal consistency indices of .73 and .80, respectively. Participants then engaged in a lexical decision task similar to

Studies 3 and 4, with slight modifications in the number of trials. Results obtained in all our previous studies indicated that suppression of the alternative goals occurred when the passionate activity was primed and the second important activity served as the target. In light of these results, two experimental conditions were created to manipulate the number of times alternative goals would be suppressed. In the *high suppression condition*, participants were exposed to 40 trials (out of 100) in which the passionate activity was primed and the second important activity was the target. In the *low suppression condition*, only 10 trials (out of 100) of the same type were presented. The experimental conditions were created in such a way that each participant was exposed to the exact same number of times to their passionate activity (50), their second important activity (50), and the neutral words (100). Only order of presentation (either as a prime or target) was varied across conditions (see Table 7).

Following the lexical decision task, participants completed a 10-item measure of positive and negative affect (Positive and Negative Affect Schedule [PANAS]; Watson, Clark, & Tellegen, 1988). This measure served to control for the possibility that suppressing alternative goals may potentially induce negative affect, which have been shown to influence self-regulation (Brownell, Marlatt, Lichtenstein, & Wilson, 1986). Reliability of the positive ( $M = 3.11$ ,  $SD = 0.81$ ) and negative ( $M = 1.38$ ,  $SD = 0.49$ ) affect yielded internal consistency indices of .81 and .77, respectively.

Participants were then told they would engage in a color recognition task (i.e., Stroop task). In this task, participants were instructed to state aloud the color with which target words were presented on the screen. These target words were color names such as *blue*, *green*, *yellow*, or *red*. The color of the text either coincided or did not coincide with the corresponding color name. For instance, the word *green* was presented with either green or red characters. In the former case, the word and the color of the text coincided, making the task relatively easy to perform. In the latter case, the word and the color of the text differed, creating a response conflict that required participants to inhibit their automatic response of reading the name of the color. The Stroop task has been shown to be a test of mental flexibility and inhibitory functions (Glass & Singer, 1972) and has recently been used to assess self-regulatory impairment (Wright, Stewart, & Barnett, 2008). In the present study, the Stroop task consisted of 100 trials divided in two blocks. Ninety percent of these trials were incongruent; that is, the text did not coincide with the color, therefore making the task difficult. The number of errors and the speed at which the Stroop task was performed served as a measure of individuals’ self-regulation ability (Gailliot et al., 2007; von Hip-

Table 7

*Frequency of Prime and Target Words for High and Low Suppression Experimental Conditions: Study 5*

Prime and target	High suppression		Low suppression	
	Second activity	Neutral words	Second activity	Neutral words
Passionate activity	40	10	10	40
Neutral words	10	40	40	10

pel & Gonsalkorale, 2005). At the end of the experiment, a funneled debriefing procedure (Chartrand & Bargh, 1996) assessed whether participants had guessed the nature of the study or had seen the subliminal primes. No participant reported any suspicion about the study or reported seeing the primes after having been told that they had been presented on the screen.

## Results

Hierarchical multiple regression analyses were used to test the study hypotheses. The first dependent measure consisted of the number of errors that occurred during the Stroop task. These results are summarized in Table 8. Error rate on the Stroop task was 3.9%: Inspection of the skewness and kurtosis indices for this variable proved normal (values ranged from  $-.58$  to  $.28$  for skewness and from  $-.62$  and  $-.88$  for kurtosis across conditions). No univariate or multivariate outliers were found. In Step 1, the experimental conditions, negative and positive affect measures as well as harmonious and obsessive passion scales were entered. The experimental conditions were dummy coded with a score of 1 assigned to the high depletion condition and a score of 0 assigned to the low depletion condition. Moreover, following Aiken and West's (1991) procedures, independent variables (i.e., harmonious and obsessive passion and experimental conditions) were centered before calculating the interaction terms. The "Harmonious Passion  $\times$  Experimental Conditions" and "Obsessive Passion  $\times$  Experimental Conditions" interactions were entered in Step 2 of the analysis.

In this analysis, Step 1 yielded a significant model,  $F(5, 61) = 5.37, p < .001$ , explaining 25% of the variance (adjusted  $R^2 = .249$ ). Results indicated that adding the interaction terms in Step 2 significantly improved upon the first model that contained only the main effects,  $\Delta R^2 = .068, \Delta F(2, 59) = 3.21, p = .04$ . The model in Step 2 was significant,  $F(7, 59) = 5.04, p < .001$ , explaining 30% of the variance (adjusted  $R^2 = .30$ ). Results in Step 2 did not yield a significant main effect for the negative affect measure ( $\beta = -.08, t(59) = -0.79, p = .43$ , but did so marginally for the positive affect measure ( $\beta = .18, t(59) = 1.77, p = .08$ ). Moreover, there was a significant effect for obsessive passion ( $\beta = .33, t(59) = 2.21, p = .03$ , harmonious passion ( $\beta = -.34, t(59) = 2.13, p = .03$ , and the experimental conditions ( $\beta = .21, t(59) = 2.06, p = .04$ ). Most importantly for the study hypotheses, the obsessive passion effect was qualified by a significant interaction

with the experimental conditions ( $\beta = .32, t(59) = 2.28, p = .02$ ; as expected, this was not the case with harmonious passion ( $\beta = .04, t(59) = 0.26, p = .79$ ).

Follow-up simple slope tests (Aiken & West, 1991) for the "Obsessive Passion  $\times$  Experimental Conditions" interaction showed that individuals who were high (i.e., one standard deviation unit above the mean) on obsessive passion made more errors on the Stroop task in the high suppression condition than in the low suppression condition ( $B = 0.47, t = 2.90, p = .00$ ). In contrast, individuals who were low (i.e., one standard deviation unit below the mean) on obsessive passion did not differ in terms of errors on the Stroop task across experimental conditions ( $B = -0.17, t = -1.11, p = .27$ ). Figure 2 illustrates the pattern of results.

A second hierarchical multiple regression analysis was conducted on the time it took participants to complete the Stroop task. The response window for each trial was between 200 and 2,000 ms. Results indicated that the time participants took to complete the task performance was unaffected by the experimental conditions, harmonious and obsessive passion, or the interaction terms (all  $p > .05$ ). Although we expected slower reaction times for individuals with high levels of obsessive passion in the high suppression condition, it is possible that the delay between blocks on the Stroop task allowed participants to maintain their speed (for similar findings see Gailliot et al., 2007).

## Discussion

The results of Study 5 indicate that when provided with numerous opportunities to suppress alternative goals (as opposed to few opportunities), obsessive passion is associated with greater self-regulatory impairment (more errors), whereas harmonious passion is unaffected by those opportunities. These results extend our previous findings and afford a deeper understanding of the relation between goal-shielding and quality of goal engagement.

First, despite being an unconscious self-regulatory strategy, goal-shielding appears to consume substantial self-regulatory resources. This notion is consistent with CET: Alternative goals should impede goal-attainment, and therefore, sufficient energy (driving force) is required to overcome those obstacles. These findings complement previous research in social cognition suggesting that some unconscious goal-pursuit may still require cognitive resources (Hassin et al., 2005; Papies & Aarts, 2010), as well as neurocognitive evidence that demonstrates that conscious

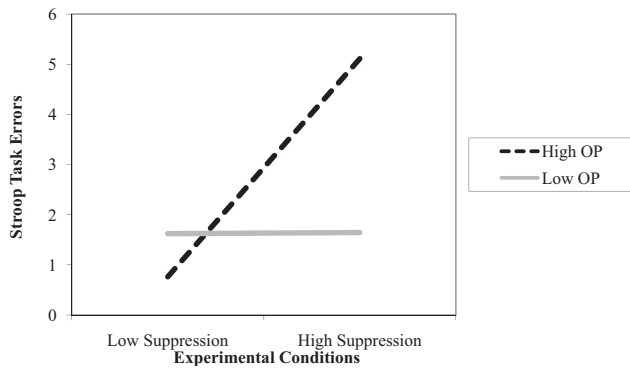
Table 8  
Results of Hierarchical Multiple Regression Analysis for Variables Predicting Stroop Task Errors: Study 5

Predictors	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Experimental condition (high depletion = 1; low depletion = 0)	1.09	0.54	.22*	1.09	0.52	.21
Obsessive passion	1.02	0.23	.52**	0.65	0.29	.33*
Harmonious passion	-0.95	0.31	-.35**	-0.92	0.43	-.34*
Negative Affect	-0.11	0.54	-.02	-0.43	0.54	-.08
Positive Affect	0.67	0.33	.22*	0.57	0.32	.18
Obsessive Passion $\times$ Experimental Condition				1.08	0.47	.32*
Harmonious Passion $\times$ Experimental Condition				0.16	0.61	.04

Note.  $N = 67$ .  $R^2 = .306$  for Step 1;  $\Delta R^2 = .374$  for Step 2 ( $ps < .05$ ). All predictors were mean centered before analysis.

\*  $p < .05$ . \*\*  $p < .01$ .





**Figure 2.** Stroop task errors as a function of the experimental conditions of alternative goal suppression and obsessive passion (Study 5). OP = Obsessive Passion; High = 1 standard deviation higher than the mean; Low = 1 standard deviation lower than the mean.

and unconscious inhibitory processes share the same brain machinery (Boy, Husain, & Sumner, 2010; Sumner et al., 2007). Moreover, our results are consistent with the recent work of Custers and colleagues (Custers, Maas, Wildenbeest, & Aarts, 2008), which demonstrated that individuals are unaware of the effort and the additional resources they expend in unconscious goal pursuit.

Although the present results may appear in conflict with Fishbach et al. (2002; Study 2), who showed that goal-shielding may operate even when individuals' working memory is under load (by retaining a nine-digit number), we propose that their work does not necessarily entail any inconsistencies with the CET framework. To explain, building on the seminal work of Brehm, Wright, and their colleagues (Brehm & Self, 1989; Wright, 2008; Wright, Brehm, & Bushman, 1989), CET proposes that "the amount of effort invested in a cognitive activity is proportionate to relevant task demands" (Kruglanski et al., 2012, p. 9), such that resource mobilization varies as a function of "what can, will, and must be done to satisfy the motive" (Wright, 2008, p. 684). Substantive evidence has supported these claims (for a recent review, see Gendolla, Wright, & Richter, 2012). Conceivably, in Fishbach and colleagues' study (Fishbach et al., 2003), retaining a long string of numbers was a difficult task that mobilized greater resources than the easiest task that did not require remembering any digits. As a consequence, when resources are mobilized, individuals are likely to succeed their goals, in that case suppressing alternative goals. What the present work shows is that once the goal is completed (suppressing alternative goals), cognitive resources that have been geared toward attaining the goal are depleted, and therefore, consistent with the strength model of self-regulation (Baumeister et al., 2007; Muraven & Baumeister, 2000), individuals may suffer impairment on a subsequent self-regulatory task. Thus, the present results complement the work of Fishbach and colleagues (Fishbach et al., 2003) by assessing post-goal-shielding effects.

In this sense then, results of Study 5 highlight the psychological costs incurred from an obsessive passion toward an activity. Our results indicate that combining obsessive passion with a repeated inhibition of alternative goals has a detrimental impact on subsequent self-regulatory performance. These findings extend Shah and Kruglanski's work (2002) that revealed poorer performance on

the inhibited goal, by demonstrating that subsequent unrelated goals that have not been directly inhibited may also suffer if they require self-regulatory resources expended in the inhibitory process. In this way, the findings of Study 5 expose the "dark side" of goal-shielding by demonstrating the tradeoffs that this process entails: Whereas goal-shielding may be helpful in promoting progress with regard to the current goal as Shah and colleagues (2002) have indicated, it may also interfere with the pursuit of subsequent goals. The net result would seem to depend on the subjective importance of present and future goals in a given situation.

## General Discussion

Effective self-regulation is essential for successful goal-pursuit. The presence of alternative goals may create tensions and conflicts with current pursuits; often this may lead to goal prioritization and inhibition of competing goals. Given sufficient "practice," such an inhibitory process may become automatic and unconscious. Nonetheless, the inhibitory activity, though momentarily helpful, is not without cost: It depletes individuals' resources, undermining the ability to self-regulate subsequent objectives. The present research based on the integration of the dualistic model of passion (Vallerand et al., 2003) and goal-systems theory (Kruglanski et al., 2002) yielded results consistent with the foregoing perspective.

Empirical evidence reported in this article supports the notion that goal-shielding is a self-regulatory strategy used to protect goals from distractions. Consistent with previous findings (Shah et al., 2002), when an important goal construct was made accessible (i.e., a passionate activity), individuals automatically inhibited alternative goals. However, the present work expands upon previous research by introducing the role of quality of goal engagement to understand *who* is most likely to goal-shield and *how* one may pay the price for chronically relying on this strategy. Across our studies, our results demonstrated that activities related to goal-conflict (obsessive passion) were consistently associated with the suppression of alternative goals, whereas activities unrelated to goal-conflict (harmonious passion) were unrelated to it. This suggests that the integration of a core activity with other life domains has important consequences on how individuals attend to alternative considerations. It also reveals that alternative goal suppression is not always the default option for highly committed individuals in regulating their multiple goals, whereas it is a chronic strategy associated with obsessive passion, and it need not necessarily be connected to harmonious passion.

The importance of quality of goal engagement for goal-shielding was particularly exemplified in Study 2. In this study, we demonstrated that harmonious and obsessive passion were similarly related to commitment to a passionate activity. Yet, goal-commitment only accentuated the obsessive-passion goal-shielding relationship. These results therefore substantiate Shah and colleagues' (Shah et al., 2002) findings that goal-commitment is a crucial moderator of goal-shielding. However, because this effect was shown to be conditional upon the association of conflict with the passionate activity, these results demonstrate that the effect of goal-commitment on goal-shielding must be understood in relation to the quality of one's goal engagement. Understanding its principles contribute to our fathom of intergoal dynamics by specifying the structural as-

sociations that are likely to develop among goals. Because different associations can develop between goals, high goal-commitment is not a sufficient condition for goal-shielding to occur; important goals that benefit from being well-integrated with other goals (as in the case of harmonious passion) do not evoke attentional competition and, thus, do not require suppressing alternative considerations.

The present work also provides an empirical demonstration of how inhibitory links develop between goals. Shah and colleagues (2002) proposed that goal-shielding is learned through repeated exposure to intergoal competition. Our results demonstrate that goals associated with conflict either chronically (Study 1) or situationally (Study 4) can lead to the suppression of novel goals. Conflict-related goals do not inhibit novel goals instantly; they progressively do so after relatively few (three) pairings with the new goal. In contrast, well-integrated goals do not develop inhibitory links with alternative goals. These are the first findings illustrating in this manner how inhibitory links may develop implicitly between goals over time. Moreover, these findings complement Danner and colleagues' (Danner et al., 2007) work on creating inhibitory links. Specifically, using a *retrieval induced forgetting paradigm*, Danner and colleagues (Danner et al., 2007) found that strengthening the association between a means and a given goal promotes the creation of inhibitory links between an alternative means and the same goal. By showing how conflict-related goals promote the creation of inhibitory links, the present findings provide novel insights with regards to the underlying cognitive mechanisms that explain how obsessive passion may increasingly overwhelm individuals' life domains.

The present results also demonstrate that passion is a dynamic construct, responsive to situational demands. The experimental manipulations used in Studies 3 and 4 were successful in inducing obsessive and harmonious passion mindsets that replicated the findings obtained in Studies 1, 2, and 3 with assessments of individual differences of these constructs. These findings obtained with this methodology (inspired by Avnet & Higgins, 2003) suggest that inhibitory links between goals can be accentuated when individuals focus on the tensions experienced within the confine of a passionate activity or eliminated when individuals focus on the integration of a passionate activity with other life domains. Thus, mindsets that pertain to the quality of activity engagement can influence the magnitude of unconscious goal-shielding processes. These mindsets have important consequences for self-regulation; as Study 4 attested, individuals in an obsessive (vs. harmonious) passion mindset progressively developed inhibitory links with novel goals, whereas individuals in a harmonious passion mindset did not create such inhibitory links over time. These results suggest that inhibitory links between goals are flexible and evolve depending on how individuals perceive the relationship of their activity with other goals.

An important finding of Study 5 has been that the unconscious inhibition of alternative goals can be effortful and resource-depleting. This result is consistent with findings that conscious and unconscious inhibitory processes operate through very similar neurocognitive architecture (Sumner et al., 2007). As Custers and colleagues (2008) have suggested, individuals may not be aware of the extra effort they are devoting to their goals. The expenditure of self-regulatory resources is not lim-

ited to conscious self-control efforts; unconscious self-regulatory processes may also consume extensive self-regulatory resources. These results, in line with the CET's propositions (Kruglanski et al., 2012), await future investigation and promise novel insights for social cognition.

Overall then, results of Study 5 indicate that over reliance on the goal-shielding strategy may cause psychological costs that affect subsequent self-regulatory performance. How much, then, is too much goal-shielding? In our view, this is a question that refers to the quality of goal engagement experienced by individuals. In essence, chronically suppressing alternative goals that vie for consideration is a sign of mental rigidity. Although this strategy may serve individuals' momentary focal goal very well in the short term, chronic neglect of other life domains will most likely produce harm and eventually create long-term life dissatisfaction. One cannot help but to remember Epicurus' famous admonition: "Be moderate in order to taste the joys of life in abundance." We believe that moderate and flexible alternative goal suppression is key: Under certain circumstances, distracters need to be ignored, but in others, distracters need to be considered and perhaps even integrated to one's focal pursuit. In our view, individuals should abstain from rigid regulatory strategies chronically restricting their attentional focus.

In sum, the present integration of the dualistic model of passion and goal-systems theory allows a better understanding of the self-regulatory processes underlying sustained activity involvement. Importantly, this integration provides a vantage point that investigates the construct of passion through the lens of a unified view of motivation and cognition, entailing the conceptualization of motivation as a goal (i.e., a cognitive construct that operates according to general cognitive principles, Kruglanski et al., 2002). The integration of both theoretical approaches provides additional insights to each perspective and leads to the generation of novel predictions. For instance, future research could investigate the relationship between obsessive and harmonious passion and the number of means generated to engage in a passionate activity. Obsessively passionate individuals would probably consider a larger set of attainment means for their activity (golf, or gambling) than harmonious individuals because the latter would exclude means that are detrimental to alternative goals, whereas the former would include them (cf. Köpetz et al., 2011). Furthermore, obsessive passion may also encourage the use of more extreme means to the passionate activity (hence means at odds with accepted norms and values), whereas harmonious passion may prompt a stronger preference for *multifinal* means capable of integrating a diverse set of goals. These predictions could be profitably explored from an integrative conceptual perspective that joins the dualistic passion model to goal systems theory.

## Conclusions

The present research addressed the question of whether the suppression of alternative goals depends on the quality of goal engagement. Our findings suggest that activities chronically or situationally in conflict with other life domains (because of obsessive passion) tend to suppress alternative goals to a greater extent than when such activities are well-integrated with other considerations (because of harmonious passion). Such effects are not due to differences in goal-commitment but rather are

due to how the activity is integrated with other life domains. Whereas prior analyses have emphasized the benefits of goal-shielding on goal-pursuit, the present work provides evidence that goal-shielding may actually incur some costs as it depletes one's self-regulatory resources and impairs one's performance on subsequent objectives despite occurring unconsciously. Rather, integrating an activity with other life domains appears more profitable for the individual.

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## Appendix A

### Harmonious (HP) and Obsessive Passion (OP) Scale Items

- |  |   |
|--|---|
| *1. This activity is in harmony with the other activities in my life.                      | *8. My activity is well integrated in my life.                            |
| **2. I have difficulties controlling my urge to do my activity.                            | **9. If I could, I would only do my activity.                             |
| *3. The new things that I discover with this activity allow me to appreciate it even more. | *10. My activity is in harmony with other things that are part of me.     |
| **4. I have almost an obsessive feeling for this activity.                                 | **11. This activity is so exciting that I sometimes lose control over it. |
| *5. This activity reflects the qualities I like about myself.                              | **12. I have the impression that my activity controls me.                 |
| *6. This activity allows me to live a variety of experiences.                              |   |
| **7. This activity is the only thing that really turns me on.                              |   |
- \*HP scale items  
\*\*OP scale items

(Appendices continue)

## Appendix B

### Hierarchical Linear Modeling Equations

#### Study 1: Alternative Goal Suppression

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious passion) +  $\gamma_{02}$  (Obsessive passion) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious passion) +  $\gamma_{12}$  (Obsessive passion) +  $u_{1j}$

#### Study 1: Progressive Unfamiliar Goal Suppression

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $\beta_{2j}$  (Trials progression) +  $\beta_{3j}$  (Prime categories  $\times$  trial progression) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious passion) +  $\gamma_{02}$  (Obsessive passion) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious passion) +  $\gamma_{12}$  (Obsessive passion) +  $u_{1j}$

$\beta_{2j} = \gamma_{20} + \gamma_{21}$  (Harmonious passion) +  $\gamma_{22}$  (Obsessive passion) +  $u_{2j}$

$\beta_{3j} = \gamma_{30} + \gamma_{31}$  (Harmonious passion) +  $\gamma_{32}$  (Obsessive passion) +  $u_{3j}$

#### Study 2

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious passion) +  $\gamma_{02}$  (Obsessive passion) +  $\gamma_{03}$  (Goal-commitment) +  $\gamma_{04}$  (Harmonious passion  $\times$  Goal-commitment) +  $\gamma_{05}$  (Obsessive passion  $\times$  Goal-commitment) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious passion) +  $\gamma_{12}$  (Obsessive passion) +  $\gamma_{13}$  (Goal-commitment) +  $\gamma_{14}$  (Harmonious passion  $\times$  Goal-commitment) +  $\gamma_{15}$  (Obsessive passion  $\times$  Goal-commitment) +  $u_{1j}$

#### Study 3

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious passion vs. control) +  $\gamma_{02}$  (Obsessive passion vs. control) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious passion vs. control) +  $\gamma_{12}$  (Obsessive passion vs. control) +  $u_{1j}$

#### Study 4: Alternative Goal Suppression

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious vs. obsessive passion) +  $\gamma_{02}$  (Self-determined motivation) +  $\gamma_{03}$  (Non-self-determined motivation) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious vs. obsessive passion) +  $\gamma_{12}$  (Self-determined motivation) +  $\gamma_{13}$  (Non-self-determined motivation) +  $u_{1j}$

#### Study 4: Progressive Unfamiliar Goal Suppression

*Level 1:*

Reaction times<sub>ij</sub> =  $\beta_{0j}$  +  $\beta_{1j}$  (Prime categories) +  $\beta_{2j}$  (Trials progression) +  $\beta_{3j}$  (Prime categories  $\times$  Trials progression) +  $r_{ij}$

*Level 2:*

$\beta_{0j} = \gamma_{00} + \gamma_{01}$  (Harmonious vs. obsessive passion) +  $\gamma_{02}$  (Self-determined motivation) +  $\gamma_{03}$  (Non-self-determined motivation) +  $u_{0j}$

$\beta_{1j} = \gamma_{10} + \gamma_{11}$  (Harmonious vs. obsessive passion) +  $\gamma_{12}$  (Self-determined motivation) +  $\gamma_{13}$  (Non-self-determined motivation) +  $u_{1j}$

$\beta_{2j} = \gamma_{20} + \gamma_{21}$  (Harmonious vs. obsessive passion) +  $\gamma_{22}$  (Self-determined motivation) +  $\gamma_{23}$  (Non-self-determined motivation) +  $u_{2j}$

$\beta_{3j} = \gamma_{30} + \gamma_{31}$  (Harmonious vs. obsessive passion) +  $\gamma_{32}$  (Self-determined motivation) +  $\gamma_{33}$  (Non-self-determined motivation) +  $u_{3j}$

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