IMPLICIT GOAL FUSION:

THE PREDICTIVE POWER OF IMPLICIT

MOTIVATIONAL MEASURES

By

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Abstract: Goal fusion refers to the perceived overlap between an individual's goal and their self-concept. This is traditionally measured with a single item explicit measure. The recent development of an implicit measure of goal fusion creates a number of questions about the predictive nature of implicit and explicit measures of intrinsic motivation. The current study examined if an implicit measure of intrinsic motivation for the goal of "being healthy" had greater predictive power for automatic goal-directed behaviors compared to an explicit measure and if an extrinsic measure had better predictive power for controlled goal-directed behaviors. The hypotheses of the current study were not confirmed but demonstrated that each measure captures unique variance on measures of automatic and controlled behavior.

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CHAPTER I

Introduction

A goal is a desired future state. If one is pursuing the goal of "being healthy" they want to be in a state of good health now and presumably in the future. Sometimes the goals we pursue define us or become a part of who we are. For example, with the goal of being healthy, those who pursue the goal of optimal health might describe themselves as "health enthusiasts". These individuals may have incorporated the goal of being healthy into their self-concept. This incorporation of the goal into the self-concept is referred to as fusion. In this scenario, the "health enthusiasts" have fused with their goal of being healthy. As with anyone whose identity has become fused with a goal, this fusion is a strong source of intrinsic motivation and will likely aid in their ability to achieve their goals (Burkley, Curtis, Burkley & Hatvany, 2015).

Fusion

Fusion refers to the degree that a construct has been incorporated into the self-concept. Research has suggested that a variety of concepts have the ability to become a part of who we are (Hatvany, Burkley & Curtis, 2017). The list includes parts of our physical body (Allport, 1955; Belk, 1988; Burris & Rempel, 2004; Prelinger, 1959) and our imprints, such as our shadow or the warmth left behind by our body after having sat somewhere (Horwicz, 1872). The list also includes physical objects that we have created or acquired (Belk, 1988; Burris & Rempel, 2010; Csikszentmihályi & Rochberg-Halton, 1981; Locke, 1690/2009; Prelinger, 1959). Beyond physical objects, we may

incorporate other people into our self-concept such as romantic partners (Aron, Aron, & Smollan, 1992; Gächter, Starmer, & Tufano, 2015), acquaintances (Gächter, et al., 2015), and groups and communities (Mashek, Stuewig, Furukawa, & Tangney, 2006; Schubert & Otten, 2002; Swann, Gomez, Seyle, Morales, & Huici, 2009; Tropp & Wright, 2001; Uleman, Rhee, Bardoliwalla, Semin, & Toyama, 2000). The concept of fusion is particularly interesting, because fusing with an object or construct can lead to an influence on our thoughts, emotions, and behaviors. For example, when something is labeled as "mine" there is a sense of ownership. The object has fused with the self-concept and, as such, we are less likely to abandon the object because doing so may feel similar to losing a part of the self (Belk, 1988: Reb & Connolly, 2007). Research has also shown that when an object is associated with ourselves, we are likely to increase the value that we place on that object (Kahneman & Tversky, 1979; Thaler, 1980). For example, the "endowment effect" (Thaler, 1980) suggests that introducing even brief ownership of a physical object increases the perceived value of the object. For example, Thaler (1980) noted that participants who were given a coffee mug selected a higher selling price on the mug than those who did not own the mug.

The endowment effect also impacts the valuation of objects owned by significant others, suggesting that we value those we are fused with (Greenstein & Xu, 2015 Zhao, Feng, & Kazinka, 2014). This, and other research on fusion within relationships, suggests that we treat fused others as we would treat ourselves, such as distributing resources equally (Aron, Aron, Tudor, & Nelson, 1991; Bourcher, 2014). Specifically, Aron and colleagues (1991) found in a series of studies that when participants were asked to allocate money amongst themselves and either a close other, a stranger, or a disliked other, participants were more equal in their distribution between themselves and the fused other compared to the stranger or disliked other. This finding remained even when the participants were informed that the partner would not be told of their decision. Thus, fusion with an object or person increases the valuation of the fused object or construct.

Similar results have been found with groups (Swann & Buhrmester, 2015; Swann et al., 2009). Swann and Buhrmester (2015) suggest that a high level of fusion with a group leads to four

primary outcomes. First, there is an increased feeling of agency and arousal, leading to greater endorsement of extreme pro-group behavior, such as displays of group loyalty and in-group biases. Second, threats to the self or group increase endorsement of extreme pro-group behaviors. Third, highly fused individuals are likely to experience more extreme emotional responses related to the group, which leads to greater endorsement of pro-group behaviors. And finally, highly fused people are more likely to remain fused with and committed to the group over time.

There is evidence that abstract concepts such as thoughts (Briñol, Gascó, Petty, & Horcajo, 2013; Tappan 1840), attitudes (Abelson & Prentice, 1989; Mead, 1913; Sherif & Cantril, 1947), beliefs (Abelson, 1986; Cooley, 1902; Prelinger, 1959), opinions (Smith, Bruner, & White, 1956), arguments (De Dreu, & Van Knippenberg, 2005), values (Csikszentmihályi & Rochberg-Halton, 1981), and goals (Burkley, et al., 2015) can also be part of our identity. Just as increased fusion changes our valuation of an object, significant others, and groups, changes in fusion will change how we value these abstract concepts. For example, increased fusion with attitudes leads to greater valuation of the attitude when observing public and private compliance with the attitude (Lepper, 1983).

This increase in value can lead to increases in commitment and feelings of responsibility toward a construct (Burkley, et al., 2015; Lepper, 1983, Schlenker, Britt, Pennington, Murphy, & Doherty, 1994; Swann, et al., 2009). For example, Burkley and colleagues (2015), found that when people were more fused with a goal, they engaged in more goal related cognition and behavior and were more likely to have accomplished their goal one month later than those who were less fused with their goal. The term goal fusion refers specifically to this fusion of a goal and the self-concept.

Burkley and colleagues (2015) found that increased goal fusion was predictive of goal related outcomes and also demonstrated that this construct was directly connected to the self-concept. For example, in one of their studies participants were given false feedback on an aptitude test related to goals that participants were either fused with or not fused with. Participants who were given positive feedback for fused goals, or negative feedback for unfused goals, had an increase in their self-concept

clarity. However, for those who were given negative feedback for fused goals, or positive feedback for unfused goals, there was a decrease in self-concept clarity. This suggests that these constructs are considered to be part of the self-concept itself. A realized aptitude for an unfused goal, or the opposite, interferes with a person's understanding of their self-concept.

Measuring Fusion

Fusion is traditionally measured with a single pictorial item. This single item measure has demonstrated good test-retest reliability (Aron et al., 1992; Burkley et al., 2015), as well as good predictive validity in a variety of domains (Hatvany et al., 2017). For example, researchers have found this single item measure useful when measuring fusion with relationships (Agnew, Van Lange, Rusbult, & Langston, 1998; Aron, et al., 1992; Aron & McLaughlin-Volpe, 2001, Gächter, et al., 2015), goals (Burkley, et al., 2015), and groups (Mashek, et al., 2006; Schubert & Otten, 2002; Swann, et al., 2009; Tropp & Wright, 2001, Uleman, et al., 2000). However, this single item pictorial type measure is an explicit measure of goal fusion. Explicit measures, in general, have two primary methodological issues. Specifically, explicit measures can be vulnerable to response styles such as socially desirability (Kihlstrom, 2004). While this is particularly relevant when studying racial attitudes (Greenwald, McGhee & Schwartz, 1998) the same may also hold true for goals that are seen a as socially desirable such as being a productive member of society, regularly voting or taking care of one's body. Additionally, explicit measures require the participant to have conscious access to the information requested by the researcher (Kihlstrom, 2004; Payne, Burkley & Stokes, 2008).

Due to these concerns regarding explicit measures, Hatvany and Burkley (in preparation) developed an implicit measure of goal fusion to capture aspects of fusion that explicit goal fusion fails to measure. The implicit measure of goal fusion was initially developed for the goal of "being healthy", since prior research has suggested this is a common goal shared by college students (Emmons, 1986). The implicit measure of goal fusion uses the semantic version (Sava et al., 2012) of the affective misattribution procedure (AMP; Payne, Cheng, Govorun & Stewart, 2005; Payne, et al., 2008). The AMP is a sequential priming task that allows researchers to evaluate implicit attitudes

towards a construct by assessing the evaluation of ambiguous stimuli following a prime, utilizing either an affective prime (evaluating the prime as "pleasant" or "unpleasant") or a semantic prime (evaluating the prime as either "like me" or "not like me"). Participants are presented with a prime followed by a neutral stimulus, originally a Chinese character. Participants are instructed to ignore the prime image and to rate the neutral image as "pleasant" or "unpleasant". Despite participants ignoring the prime, the affect one attributes to the prime is misattributed to the Chinese character.

Payne and colleagues (2005) found that using this procedure was an effective method of capturing implicit attitudes. Specifically, their findings revealed that the AMP detected attitudes towards items that were universally liked or disliked, predicted behavior intentions, and predicted explicitly measured attitudes when participants were not motivated to conceal their attitudes. For example, during the US presidential election in 2004 explicit measures of attitudes towards both candidates were predicted by an AMP designed to measure implicit attitudes towards both candidates. Additionally, when measuring racial bias, the AMP was shown not to correlate with explicit measures when individuals were motivated to conceal racial bias, suggesting that the AMP was in fact tapping into implicit attitudes held by participants (Payne, et al., 2005).

The affective misattribution procedure has some advantages over other implicit measures, such as the implicit association test (Greenwald, et al., 1998), because it has greater structural fit with explicit measures (Payne, et al., 2008). Structural fit (the degree that the implicit measures and explicit measures of a construct resemble one another in form) is relevant in that poor structural fit yields poor correlations between implicit and explicit measures. This creates the need to covary out these differences when comparing implicit and explicit processes (Payne et al., 2008). Data collected from the AMP has the same structure as data from many of the other measures for attitudes. While an implicit association test provides a reaction time, the AMP provides an evaluative response similar to the evaluative nature of many explicit measures. AMP is an expression of an attitude as opposed to a reaction time. To increase this structural fit for fusion, a modified version of the AMP, the semantic misattribution procedure (SMP) was used. Instead of evaluating the prime as "pleasant" or

"unpleasant", participants evaluate whether or not the neutral prime fits them for who they are by responding with "does fit me" or "does not fit me". This technique allows an examination of how the prime fits with the participant's self-concept or personality (e.g., Sava et al., 2012).

Hatvany and Burkley's (in preparation) measure uses low-tech methods to implement the semantic version of the affective misattribution procedure. This low-tech version uses PowerPoint to present the primes and pencil and paper to collect data from the participants. The primary advantage of such a measure is that it allows researchers to collect a large amount of data in a single session, for example in a classroom. Researchers have found that this low-tech procedure has comparable psychometric properties to the computer version of the AMP (Bock, Hatvany, Burkley & Burkley, in preparation). Specifically, they found some internal reliability, good test-retest reliability, and criterion, related validity with comparable direction and magnitude as the computer-based AMPs.

Hatvany and Burkley (in preparation) found similar predictive power for their implicit measure of goal fusion including high internal reliability. Specifically, after controlling for explicit goal fusion, implicit goal fusion was a significant predictor of vigorous exercise, the number of healthy meals consumed per week (out of 21 meals), and the reported consumption of unhealthy food. Additionally, the implicit measure was predictive of intrinsic motivation for the goal of being healthy, exercising, and eating healthy after controlling for the explicit measure of goal fusion. As predicted, this implicit measure of goal fusion did not relate to extrinsic measures of motivation. This relationship with intrinsic and extrinsic motivation highlights that this measure of fusion using the SMP is tapping into a construct that is predictive of intrinsic motivation and not extrinsic motivation. This further suggests that it is representative of motivation stemming from the self-concept and not external motivators.

Implicit versus explicit measures

Hatvany and Burkley (in preparation) found one predictive difference between the explicit and implicit measures of goal fusion. Specifically, after controlling for explicit goal fusion, the implicit measure of goal fusion was predictive of both the number of healthy meals consumed per

week and the consumption of unhealthy foods. However explicit goal fusion was not predictive in the overall model for the consumption of unhealthy foods but was for the number of healthy meals consumed per week. The consumption of healthy meals is likely a more controlled behavior, as controlled behaviors are thought out and usually consciously motivated, compared to the consumption of unhealthy foods. For example, individuals may plan their meals more than their snacking behavior. Snacking behavior could be considered more automatic and less controlled compared with the number of healthy meals people consume per week. Specifically, in this measure of the consumption of unhealthy foods, participants were asked the frequency that they consumed eight different foods, half of which are often consumed as snacks.

Upon analysis of the individual items, food consumed as a snack or outside of meals was predicted more by the implicit measure than the explicit measure. For example, fast food is one of the listed items and requires an individual to make a decision to go to a fast food location. This was predicted by explicit goal fusion but not by implicit goal fusion in the overall model. However, implicit goal fusion was predictive of chocolate consumption and candy consumption while explicit goal fusion was not (Hatvany & Burkley, in preparation).

These findings are consistent with research on attitudes. Specifically, that implicit measures are most predictive of behavior when those behaviors are not pursued in a controlled fashion (Friese, Hofmann, & Schmitt, 2008). Additionally, implicit measures are significantly better at predicting nonverbal and automatic behaviors compared to explicit measures, whereas explicit measures are better predictors of explicit behaviors (Dovidio, Kawakami, & Gaertner, 2002; Lambert, Payne, Ramsey, & Shaffer, 2005; Sekaquaptewa, Espinoza, Tompson, Vargas & von Hippel, 2003). Specifically, nonverbal and/or implicit prejudicial behaviors, were predicted by implicit measures of attitudes towards groups. For example, Sekaquaptewa and colleagues (2003) found that an implicit measure of attitude towards blacks was predictive of what questions participants selected from a list to ask a Black participant. Specifically, the questions were ranked from most stereotypical to least and those with stronger negative implicit attitudes towards Black individuals chose more stereotypical

questions. Since participants were unaware of the ranking, this can be considered an implicit behavior (Whitley & Kite, 2009). If implicit measures of attitudes have better predictive power for implicit or automatic behaviors, we might expect similar results for implicit measures of intrinsic motivation.

It is important to note that research has shown that people pursue goals by both explicit and implicit means (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001). Specifically, people often pursue goals in more au tomatic ways as a result of regularity and consistency (Galla & Duckworth, 2015; Gollwitzer, 1999). Given this, it would make sense that the implicit measure of goal fusion would be particularly predictive of these automatic or more habitual behaviors we engage in when pursuing a goal. This is because our conscious controlled system is not triggering these behaviors and they are instead active by the automatic system (Aarts & Dijksterhuis, 2000; Bargh, et al., 2001; Ouellette & Wood, 1998) that is best measured with an implicit measure as these measures largely capture automatic processes (Friese et al, 2008; Greenwald & Banaji, 1995; Payne et al., 2005). Given that an automatic process is driving variation in the measure and an automatic process is driving behavior, we see higher levels of measurement behavior congruence (De Houwer, 2006; Friese et al., 2008).

Measuring automatic behaviors

Research examining the relationship between implicit attitudes and implicit behaviors has operationalized implicit behaviors as nonverbal behaviors (Dovidio, et al., 2002), or behaviors deemed implicit (e.g., when one has no knowledge that their behavior was a potentially prejudicial behavior). Specifically, Sekaquaptewa and colleagues (2002) found that when presented with a list of questions to ask another participant of another race, participants' implicit attitudes were predictive of whether or not they selected stereotypical questions. This occurred despite participants' having no knowledge that the questions had been previously evaluated as stereotypical or not. However, using this type of technique for research on implicit motivation is not feasible, as nonverbal behavior is usually not goal-directed, and behaviors deemed implicit likely vary significantly between participants working towards goals in different ways.

For these reasons, an alternative approach to examining automatic behaviors involves measuring the automaticity of the behaviors participants engage in when pursuing a goal. Automatic responses themselves should be triggered by both temporal and contextual cues (Aarts & Dijksterhuis, 2000; Bargh, et al., 2001; Ouellette & Wood, 1998). For example, some people may have developed an automatic response to get up and run every morning when they wake up. This temporal cue, first thing in the morning, activates the behavior without requiring conscious effort (Danner, Aarts, & de Vries, 2008). Cues related to location can also elicit these types of automatic responses (Ouellette & Wood, 1998). For this reason, measuring the stability of temporal or location-related behavior appears to be an appropriate measure of automaticity (Danner, et al., 2008; Galla & Duckworth, 2015; Wood & Neal, 2009), particularly in the context of goal-directed behavior.

In line with this, the regularity of the behavior should also signal that a behavior is automatic (Ouellette & Wood, 1998). For example, if a behavior occurs regularly it is more likely to have developed into a habitual or automatic behavior (Wood & Neal 2007). Therefore, a measure of frequency paired with a measure of regularity, showing frequent regular behavior, should be emblematic of automatic behavior.

In addition to using these measures of frequency and automaticity, the self-report index of habit strength (SRHI; Verplanken & Orbell, 2003), an explicit measure of automatic behavior, can provide an additional measure of automatic or habitual behavior. By measuring the history of repetition, automaticity, and expressed identity (Gardner, Abraham, Lally, & de Bruijn, 2012), this scale provided another measure of habit without having to measure behavioral frequency. Such a measure of automaticity in concert with measures of contextual stability and behavioral frequency should provide for a clear indication of the automatic nature of a behavior. Additionally, these measures should allow examination of behaviors that are engaged in consciously. As such, these measures of automaticity are ideal for comparing the predictive power of the implicit and explicit measures of goal fusion.

Measurements of temptation could also provide insight into which behaviors are automatic and controlled. Automatic behaviors themselves should be relatively immune to temptation. When choosing between the behavior and a tempting alternative, the required effort to choose the behavior should be substantially less if the behavior is automatic or habitual, rather than controlled (Danner, et al., 2008; Galla & Duckworth, 2015; Gollwitzer, 1999). Additionally, choosing a controlled behavior over a temptation is likely to require self-control (Muraven & Baumeister, 2000). One's ability to use self-control may weaken with repeated use (Muraven, Tice, & Baumeister, 1998). Reported effort or use of self-control when engaging in a task would be emblematic of it being controlled, and therefore not automatic. Weakened self-control would also increase the likelihood of regulatory failure (Baumeister & Heatherton, 1996). Therefore, reports of effort required to resist alternative behaviors, or difficulty in resisting these behaviors, should be representative of more controlled behaviors. As such, the predictive power of explicit goal fusion should be greater than the predictive power of implicit goal fusion for such behaviors.

Trait self-control

Beyond examining the effort to engage in a behavior and one's ability to resist temptation, it would likely be beneficial to measure trait self-control (Tangney, Baumesiter, & Boone, 2004). Recent research has suggested that individuals who are high in trait self-control have more automatic behaviors (Galla & Duckworth, 2015), and that individuals who are high in trait self-control often place themselves in situations that reduce temptation (Ent, Baumeister, & Tice, 2015). Trait self-control is a measure of one's general ability to resist temptation (Tangney et al., 2004). Individuals with higher trait self-control have been connected to a variety of benefits, such as increased academic performance, fewer bad habits, and better adjustment. One explanation for this is that those high in trait self-control are better at exerting self-control in the face of temptations (Ent, et al., 2015). However, recent research has suggested that those high in trait self-control actually engage in less effortful control when achieving goals (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Ent et al., 2015; Galla & Duckworth, 2015: Hofmann, Baumeister, Förster, &

Vohs, 2012). This suggests that those high in trait self-control do not just have greater ability to exert self-control in a given situation, but likely succeed because they have also developed a number of habitual or automatic behaviors (Galla & Duckworth, 2015) and avoid temptations (Ent et al., 2015).

These findings suggest that those high in trait self-control have more automatic behaviors in general, meaning that as an individual difference, separate from the motivational effect of fusion, trait self-control should moderate the predictive power of the two fusion measures. Specifically, high trait self-control should increase the predictive power of the implicit goal fusion measure on automatic behaviors, and low trait self-control should increase the predictive power of the explicit goal fusion measure on controlled behaviors.

Present theory

If the implicit goal fusion measure is truly an implicit measure, it should be more predictive of automatic behaviors than the explicit goal fusion measure. Thus, when a behavior is considered more automatic by measures of its stability and automaticity, the implicit goal fusion measure should have greater predictive power than when the behavior is controlled or less automatic. In addition, when the behavior is rated as effortful, or the avoidance of temptation is either unlikely or difficult, the implicit measure is unlikely to be predictive of the behavior. All of these predictions themselves should be moderated by the effect of trait self-control as a result of its relationship to habituation and temptation avoidance.

Hypotheses

1a. There will be a significant correlation between SRHI scales for both exercise and healthy eating and the implicit goal fusion measure.

1b. There will be stronger positive correlations between implicit goal fusion and the exercise version of the SRHI scale than with the explicit goal fusion measure. This, should again be seen between implicit goal fusion and the healthy eating version of the SRHI scale. These same patterns should hold true for the individual subscale of the SRHI automaticity as well as the measure of habit strength for both exercise and healthy eating.

2. Stronger positive correlations will occur between explicit goal fusion and the measures of effort and measures of inhibition for both exercise and healthy eating behaviors compared with the implicit goal fusion measure.
3. Implicit goal fusion will predict measures of automatic behavior, specifically, the measure of habit strength, the SRHI, and the SRHI subscale automaticity, for both exercise and healthy eating, above and beyond that of explicit goal fusion. Conversely, explicit goal fusion will predict effortful behaviors, specifically, the measure of effort and the measure of inhibition, for both exercise and healthy eating, above and beyond that of implicit goal fusion.
4. The predictive power of implicit goal fusion and explicit goal fusion will be moderated by trait self-control, such that for those high in trait self-control the predictive power of implicit goal fusion will be greater on measures of automatic behavior, specifically, the measure of habit strength, the SRHI, and the SRHI subscale for automaticity, for both exercise and healthy eating. Conversely, low trait self-control will increase the predictive power of implicit goal fusion on measures of effortful behavior, specifically, the measure of effort and the measure of inhibition, for both exercise and healthy eating behaviors.

Exploratory hypotheses

In addition to the moderating effect of trait self-control on implicit goal fusion, the relationship between trait self-control and explicit goal fusion is worth exploring. The opposite moderation between implicit, trait self-control and outcome variables should hold true for explicit goal fusion, such that for those low in trait self-control, explicit goal fusion should be a better predictor of automatic behaviors, specifically, the measure of habit strength, SRHI, and SRHI subscale for automaticity, for both exercise and healthy eating, compared to those high in trait self-control.

CHAPTER II

Methods

Participants

A power analysis with 95% power for a small to moderate effect ($f^2 = .07$) with six predictors suggested the need for 224 participants. However, given the nature of the Semantic Misattribution Procedure, data is often unusable as a result of missing data or failure to follow directions (i.e., selects all in the affirmative or negative or does not respond to one or more of the primes). A conservative loss rate of 25% was estimated based on previous implicit goal fusion research (Hatvany & Burkley, in preparation). Other SMP research has seen loss rates between 22% and 9% (Sava et al., 2012). This resulted in a final desired sample of 300 participants.

The final sample size was 434 participants. Of these, 27 participants were removed for failure to follow directions (responded all in the affirmative or negative to the implicit goal fusion measure). A further 31 participants were removed because they reported the ability to read the Chinese characters, reported participating in similar studies previously or reported English as a second language, which was deemed an exclusion criterion given the nature of the semantic primes. The remaining 376 participants were 67% were female, an average age of 18.69 years, and 86.7% white. Of this subset of 376 participants, unexpectedly (and inconsistent with previous research; e.g., Hatvany & Burkley, in preparation), only 225 participants answered the explicit goal fusion picture item. The demographics for the remaining 225 participants were similar at 69.8% female, an average age of 18.69 years and 84.9% white. Consistent with procedures used

in previous implicit goal fusion research (Hatvany & Burkley, in preparation), participants who failed to respond to the survey were removed using list wise deletion.

Procedures

Participants were recruited for the study in introductory level psychology courses at Oklahoma State University. Students were compensated for their participation with 0.5 research credit. At the beginning or towards the end of class, participants were presented with a consent form to read and sign detailing the potential risks and rewards for participants, as well as information about the primary investigator for the study. Participants were informed they would be participating in a study examining how people avoid distractions. If students did not wish to participate, they were provided with an alternative assignment allowing them to earn 0.5 research credits.

Implicit goal fusion AMP

Participants were trained to respond to the procedures and had an opportunity to practice the procedure before the implicit goal fusion AMP was presented ($\alpha = .75$). As a group, participants completed the implicit goal fusion AMP, using the low-tech version of the AMP (Burkley et al., under review) at their desks. Bock and colleagues (in preparation) found this PowerPoint based version to have good test-retest and some internal reliability, strong validity and comparable effect sizes to computer-based AMPs. Additionally, previous research on implicit goal fusion used this low-tech version of the AMP (Hatvany & Burkley, in preparation) and found high internal consistency and strong validity.

In each trial, students were presented with a prime word for 750ms followed by a neutral pictograph for 750ms. These were then followed by a backwards mask of a noise pattern. Students were instructed to consider that they are creating a personalized t-shirt for themselves. They were asked to “evaluate the pictograph on the basis of whether or not it fits who you are as a

person." During the presentation of the backwards mask they recorded on a sheet of paper whether it "does fit me" or "does not fit me" before returning their attention to the screen for subsequent trials. Similar methods have been used to assess implicit personality (Sava et al., 2012).

Pilot testing indicated the goal "to be healthy" was the most common goal pursued by students at Oklahoma State University (46%). For the implicit goal fusion AMP, three types of stimulus words were used: positive health words (*healthy, vegetable, gym, exercise, fitness, slim, healthy eating, and diet*), negative health words *(unhealthy, overweight, binge, soda, fat, lazy, candy, and couch potato*), and neutral words (*wagon, tree, temperature, neutral, door, ladder, liquid, nickel*). Participants were randomly presented with a total of eight positive health words, eight negative health words, and eight neutral words. Each word was repeated twice, for a total of 48 trials. This number of trials is consistent with prior AMP research (Imura, Burkley, & Brown, 2014; Payne, Krosnick, Pasek, Lelkes, Akhtar, & Thompson, 2010,)

Each of these trials was then coded such that "does fit me" responses were coded as one and "does not fit me" responses were coded as zero. Each category of primes was then summed resulting in positive, negative, and neutral prime totals. An implicit goal fusion score was calculated by subtracting the negative prime total from the positive prime total.

Health outcomes

Once the participants completed the AMP portion of the experiment, they completed a series of self-report measures including a series of health-related items. The items included questions about height and weight to calculate BMI, the number of healthy meals eaten (out of 21 meals eaten each week), their frequency of exercise, their frequency of consuming unhealthy food, and about their snacking behavior (see appendix C).

Automaticity measures

The self-report habit index, SRHI (Verplacken & Orbell, 2003), a 12-item explicit measure of habit strength, was used to assess both exercise (α = .96) and healthy eating behaviors (α = .96). The scale allows for alterations based on the goal in question. Given that "being healthy" has multiple facets, including exercise and healthy eating, a version of scale was presented for both of these facets (e.g. one version asked about exercise behaviors and one version had questions regarding healthy eating behaviors). The SRHI has a subscale that specifically measures, automaticity (Gardner, et al., 2012). Because implicit goal fusion should relate highly to part of the SRHI that is concerned with how the behavior is a part of one's identity, the automaticity subscale was also used specifically to determine the automatic nature of the behaviors. These subscales were computed for both exercise automaticity (α = .94) and healthy eating automaticity (α = .93).

In addition to the SRHI, habitual behaviors should be relatively frequent, temporally stable, and context specific. Based on previous research (Galla & Duckworth, 2015) and in line with recommendations from Wood and Neal (2009) and Danner and colleagues (2008), a composite score for healthy eating habits (α = .85) and exercise (α = .83) was created by multiplying ratings of behavioral frequency (1 = *a few times per month or less*, 2 = *at least once a week*, 3 = *a few times per week*, 4 = *just about every day*), temporal consistency (1 = *rarely or never at the same time of day*, 2 = *sometimes at the same time of day*, 3 = *usually or always at the same time of day*), and consistency of location (1 = *rarely or never in the same place*, 2 = *sometimes in the same place*, 3 = *usually or always in the same place*). Participants also had the option of selecting 0 if they do not engage in the behavior. This resulted in a measure of habit strength or automaticity ranging from 0 to 36.

Effort and Inhibition

Participants also indicated the effort required in order to achieve the behavior. Based on procedures that measured effort and inhibition from Galla and Duckworth (2015), participants

were asked the most recent time they exercised or ate a healthy snack. They were then asked to report the amount of effort required to initiate both exercise and healthy eating "How hard was it for you to get yourself to…?" (1 = *Not hard at all, I did not have to use a lot of willpower* to 7 = *Very hard, I had to use a lot of willpower*). Participants were then asked how much time it took them to initiate both exercise (p =.84) and healthy eating (p =.79) "How long did it take you to decide whether or not to…?" (1 = *I didn't have to think about it, I made the decision automatically* to 7 = *It took me a while to make the decision*).

Inhibition was measured in a similar way, again using procedures from Galla and Duckworth (2015), by asking participants "in general how difficult is it to resist the temptation to do something other than …?" (1 = *It is very easy to resist the temptation to do something other than…* to 7 = *It is very difficult to resist the temptation to do something other than…)* and "in general how often do you have to resist/overcome temptation to do something other than…?" (1 = *I never have to overcome the temptation to do something other than…* to 7 = *I always have to overcome the temptation to do something other than…*), for both exercise (p =.73) and healthy eating (p =.71). A composite score for each of the behaviors were then calculated by adding the scores of these two questions.

Trait self-control measure

The 13-item brief self-control measure (α = .85, Tangney et al, 2004), was included as a potential moderator of the predictive effect of the implicit and explicit measure on automatic and controlled behaviors respectively.

Other measures

Additional measures included the explicit measure of Goal Fusion (Burkley et al., 2015) for the goal to be healthy. This assessment has participants select one of 5 pictures. Each picture has two circles one labeled "self" and one labeled "goal", with varying degrees of overlap ranging

from not overlapping to completely overlapping. The greater the overlap, the greater the explicit goal fusion.

Participants also completed demographics questions with some additional health related questions including gender, age, anticipated year of graduation, race, marital status, if English is their first language, if they know Chinese or are aware of the meaning of any of the Chinese characters, and if they have participated in any similar research in the past. Following completion of the questionnaires participants were debriefed and given an opportunity for questions before being dismissed from the study.

CHAPTER III

Results

Based on recommendations from Field (2013), before conducting the planned analyses, the assumptions for linear regression analyses were tested. To test for linearity of residuals, homoscedasticity of variances and independence of residuals, scatter plots of the residuals and predictors were produced and visually inspected. The assumption of normality of residuals were tested using the Durbin-Watson test in conjunction to a visual inspection of histograms for skewness and kurtosis. The results of these tests indicated that further analyses would be appropriate.

Analyses

To test the first two hypotheses, the explicit and implicit goal fusion measures were correlated with the different measures of automaticity. Namely, both measures of fusion were correlated with the total SRHI scores, the automaticity subscale of the SRHI, measures of habit strength, effort, and inhibition for both exercise and healthy eating behaviors. Statistical tests, using fisher's r to z transformation, were used to compare whether the correlation coefficients between explicit goal fusion and the outcomes and implicit goal fusion and the outcomes were statistically significantly different. These correlations are listed in Table 1. Explicit goal fusion and implicit goal fusion statistically significantly correlated with all measures of habit for both healthy eating and exercise, correlations ranged in magnitude from .2 to .5. However, no statistically significant differences were found in the magnitude of the correlations between explicit goal fusion and implicit goal fusion on any of the measures of habit (see table 1).

To test the hypothesis that implicit goal fusion was a better predictor of automatic behaviors than explicit goal fusion, a series of hierarchal linear regression analyses were completed. Implicit and explicit goal fusion were regressed onto measures of habit strength, SRHI scores, SRHI subscale for automaticity, effort, and inhibition measures for exercise and healthy eating. Explicit goal fusion was entered into the first block and implicit goal fusion was entered into the second block, with measures of habit strength, SRHI scores and the subscale score for both exercise and healthy eating as outcome variables. To test the hypothesis that explicit goal fusion was a better measure of controlled behaviors, implicit goal fusion was entered in the first block and explicit goal fusion in the second block with measures of effort and inhibition for both exercise and healthy eating as outcome variables.

For example, it was found that implicit goal fusion predicted self-report habit index scores for exercise when controlling for explicit goal fusion, $R^2 = .16$, $\beta = .22$, $t\ (1,222) = 3.23$, $p = .001$. The remainder of these results are displayed in table 2. These analyses revealed that implicit goal fusion measured unique variance above and beyond explicit goal fusion for measures of automatic behavior and that explicit goal fusion measured unique variance above and beyond implicit goal fusion for measures of controlled behavior. For example, when examining implicit goal fusion on self-report habit index scores for exercise, while controlling for explicit goal fusion, the unique variance of implicit goal fusion accounts for four percent of the variance, $R^2_{change} = .04$, $F\ (1,222) = 10.45$, $p = .001$. These results by themselves suggest that the two measures add to the predictive power of the model.

Given the failure to find evidence for the first two hypotheses a series of exploratory regression analyses were run, entering the measures of goal fusion into the opposite block as in the previous analyses. These results indicated that explicit goal fusion explained unique variance above and beyond implicit goal fusion on measures of automatic behavior and that implicit goal fusion explained unique variance above and beyond explicit goal fusion on measures of controlled behavior. For example, it was found that explicit goal fusion predicted self-report habit

index scores for exercise when controlling for implicit goal fusion, $R^2 = .16$, $\beta = .26$, $t\ (1,222) = 3.85$, $p < .001$. Additionally, in this regression explicit goal fusion accounted for more variance, $R^2_{change} = .06$, $F\ (1,222) = 14.82$, $p < .001$, although not statistically different from the previous example. These results run contrary to the original hypothesis suggesting that while both of these measures provide unique predictive abilities, neither serves as a better measure of automatic or controlled behaviors.

Finally, a series of nonparametric bootstrapping procedures with 5000 bootstrapping samples as outlined by Hayes (2013; model 1) was used to test the hypothesis that trait self-control has a moderating effect on the predictive power of implicit goal fusion on automatic and effortful behaviors. For this, each of the measures of automaticity and effortful behavior for both exercise and healthy eating behaviors, were entered as outcome variables, implicit goal fusion as the predictor variable, and trait self-control as a moderator. None of these moderation analyses showed a moderation effect of trait self-control on the relationship between implicit goal fusion and the different outcome variables. This suggests that trait self-control does not influence the relationship between implicit goal fusion and measures of automatic or effortful behavior.

Exploratory analyses

Additionally, exploratory analyses were conducted exploring the hypothesis that a relationship between explicit goal fusion and trait self-control on outcome variables related to the goal of being healthy. In another series of nonparametric bootstrapping procedures with 5000 bootstrapping samples each as outlined by Hayes (2013; model 1) were used to test if trait self-control has a moderating effect on the predictive power of explicit goal fusion on automatic behaviors. For this, each of the measures of automaticity, for both exercise and healthy eating behaviors, was entered as outcome variables, explicit goal fusion as the predictor variable, and trait self-control as a moderator. None of these moderation analyses showed a moderation effect of trait self-control on the relationship between explicit goal fusion and the different outcome

variables. This suggests that trait self-control does not influence the relationship between explicit goal fusion and measures of automatic or effortful behavior.

CHAPTER IV

Discussion

The results of this study do not support the original hypotheses that the implicit measure of goal fusion would be a better measure of automatic behaviors. However, the study did suggest that both the implicit and explicit measures are effective measures of automatic as well as controlled behavior. One of the original hypotheses was supported, showing that the predictive power of the implicit goal fusion measure above and beyond explicit goal fusion on measures of automatic behavior. While these findings are consistent with what was predicted, the absence of support for the other hypotheses suggests that implicit goal fusion just predicts unique variance instead of more variance. The results of the exploratory analyses, hierarchical regression analyses examining the predictive power of explicit goal fusion on automatic behaviors while controlling for implicit goal fusion, or the reverse of the planned regressions for the third hypothesis showed that explicit goal fusion also measured unique variance beyond implicit goal fusion. This suggests that although implicit goal fusion is a unique predictor of automatic behavior, it is not a better predictor as explicit goal fusion also serves as a unique predictor of automatic behavior.

These findings while counter to the original hypothesis do provide us with some valuable findings. First our findings provide further support to previous research (Hatvany & Burkley, in preparation) that implicit goal fusion and explicit goal fusion each provide unique predictive abilities for behavioral outcomes. In addition, for the first time there is evidence suggesting that both versions of goal fusion positively predict automaticity and negatively predicts measures of controlled behavior.

Beyond these findings the results of our moderation analyses did not lend support to the hypothesis that trait self-control would serve as a moderator of the relationship between implicit goal fusion and automatic behavior. Nor did they support the exploratory hypotheses that trait self-control would moderate the relationship between explicit goal fusion and effortful behavior. This does not come as a surprise after the findings regarding the other hypothesis, that implicit goal fusion does not serve as a better predictor of automatic behaviors than the explicit goal fusion measure. However, these findings do provide some interesting thoughts for future research. Specifically, the finding in previous research that trait self-control was associated with more automatic behaviors (Galla & Duckworth, 2015) does not seem to be influenced by motivation. Meaning that, while those with high trait self-control might be better at developing habits generally, intrinsic motivation towards a goal does not increase the influence trait-self-control has on developing goal related habits.

These findings might provide support for some of the other explanations of how trait self-control is related to more habitual behaviors. Specifically, trait self-control's connection to automatic behaviors is as a result of improved self-regulatory strategies requiring little to no motivation (Ent et al, 2015: Galla & Duckworth, 2015) such as preparing one's environment to avoid distraction.

Limitations and future research

One of the major limitations to this study is the failure of over 150 participants to respond to the explicit goal fusion question. This result was unexpected as the explicit goal fusion question was the first self-report question presented to participants and is clearly its only question. Additionally, this particular part of the procedure was identical to procedures used in previous implicit goal fusion research where this did not occur (Hatvany & Burkley, in preparation). After collecting approximately 160 participants' worth of data, this failure to respond was detected and from that point onward participants were verbally instructed to not move on to other questions before answering the explicit goal fusion question. However, despite

this added direction participants continued to leave this question blank at a rate much higher than expected. Although the true reason for this poor response rate is unknown, one possibility is how the question was presented. The paragraph instructing participants to select a picture for the explicit goal fusion (see appendix C) starts with a header with the word “Instructions”. While this was identical to previous procedures using this measure (Burkley et al., 2015; & Hatvany & Burkley, in preparation), and participants were clearly instructed to read all instructions both in writing and verbally, this might have explained these results. Future research might want to consider removing this header and replacing it with a number clearly denoting that it is a question to be answered.

Another limitation of this study is the reliance on self-reported measures of behavior. While implicit goal fusion did predict the level of automaticity in these self-reported measures, the self-reported measures may not have captured behavior that truly occurred automatically. In this case the participants may not have had conscious access to this information or felt that they should portray themselves in a socially desirable way (Kihlstrom, 2004). Future research should address this through observation of actual behavior, and/or potentially using biometric monitoring devices.

While both of these measures seem to be good predictors of automatic behaviors, future research should explore if goal fusion is capturing the habitual nature of these predictors or if it is just capturing the overall amount of goal directed behaviors. The current evidence suggests that this is not the case by measuring effort and inhibition. However, parsing out if fusion is measuring the behavior itself or the habitual nature of the behavior would be an interesting area for further exploration.

Finally, another limitation is the multiple facet nature of the goal of being healthy. One can pursue the goal of being healthy by engaging in a number of different behaviors (e.g. physical activity, healthy eating, or pursuit of other medically beneficial behaviors). One’s pursuit of being healthy may not be captured by either fusion measure the same as these measures might capture

pursuit with a single faceted goal or more specific goal such as engaging in physical activity. Future research should explore this relationship across different goals, but also include specific goals with specific behavioral measures just as specific attitudes correlate stronger with specific behaviors (Fazio, 1986).

In line with this, future research should explore how the positive and negative primes may relate to regulatory focus theory (Higgins, 1999). While presumably negative primes might relate closely to a prevention focus and positive primes relate to a promotion approach we did not explore this in this research. This was primarily because the outcome measures present looked to examine automatic behaviors, as they are habitual, operate separate from regulatory focus.

Conclusion

While these findings do not support the original hypotheses, the findings do suggest that both implicit goal fusion and explicit goal fusion are effective at predicting the degree to which one's goal directed behaviors are automatic or controlled. To date no previous research has linked fusion with the self-concept and predicting the form of goal directed behavior. These findings suggest that although our implicit and explicit measures did not differ in their predictive power in this study, exploring the manner in which motivational measures predict behaviors might be a future area of scientific pursuit.

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APPENDICES

Appendix A

Table 1

*Correlations between outcome variables and both measures of goal fusion with fisher r to z transformation (correlation between IGF and EGF, r = .421***)*

Measure of behavior	*IGF*	EGF	*Z*	*P value*
Exercise Self-Report Habit Index	.35***	.35***	-.05	.96
Exercise Self-Report Habit Index (automaticity)	.28***	.27***	.06	.95
Exercise effort measure	-.27***	-.31***	.51	.61
Exercise inhibition measure	-.21***	-.26***	.67	.50
Exercise habit strength measure	.26***	.33***	-.89	.37
Healthy eating Self-Report Habit Index	.44***	.50***	-.92	.35
Healthy eating Self-Report Habit Index (automaticity)	.38***	.47***	-1.29	.19
Healthy eating effort measure	-.33***	-.36***	.39	.69
Healthy eating inhibition measure	-.21***	-.20***	-.05	.96
Healthy eating habit strength measure	.39***	.45***	-.88	.38

* = p < .05, ** = p < .01, *** = p <.001

Table 2

Predictive power of IGF when controlling for EGF

Measure of behavior	R^2	R^2 change	β	*t*	*p-value*
Exercise Self-Report Habit Index	.16***	.04	.22	3.23	.001
Exercise Self-Report Habit Index (automaticity)	.10***	.02	.17	2.43	.016
Exercise effort measure	.11***	.02	-.15	-2.17	.031
Exercise inhibition measure	.08***	.01	-.10	-1.40	.163
Exercise habit strength measure	.14***	.03	.20	2.96	.003
Healthy eating Self-Report Habit Index	.32***	.07	.29	4.762	<.001
Healthy eating Self-Report Habit Index (automaticity)	.26***	.04	.223	3.49	.001
Healthy eating effort measure	.16***	.06	-.28	-4.133	<.001
Healthy eating inhibition measure	.05*	.01	-.09	-1.28	.204
Healthy eating habit strength measure	.23***	.02	.17	2.65	.009

* = p < .05, ** = p < .01, *** = p <.001

Table 3

Predictive power of EGF when controlling for IGF

Measure of behavior	R^2	R^2 change	β	*t*	*p-value*
Exercise Self-Report Habit Index	.16***	.06	.260	3.85	<.001
Exercise Self-Report Habit Index (automaticity)	.10***	.03	.20	3.82	.005
Exercise effort measure	.11***	.05	-.24	-3.49	.001
Exercise inhibition measure	.08***	.04	-.22	-3.04	.003
Exercise habit strength measure	.14***	.05	.24	3.55	<.001
Healthy eating Self-Report Habit Index	.32***	.12	.38	6.18	<.001
Healthy eating Self-Report Habit Index (automaticity)	.26***	.11	.37	5.827	<.001
Healthy eating effort measure	.16***	.03	-.20	-2.89	.004
Healthy eating inhibition measure	.05*	.02	-.164	-2.27	.024
Healthy eating habit strength measure	.23***	.12	.38	5.75	<.001

* = p < .05, ** = p < .01, *** = p <.001

Appendix B

Consent Form

Project Title: Distraction Avoidance

Investigator: Thomas Hatvany & Dr. Ed Burkley

Affiliation: Oklahoma State University

Purpose: The purpose of this study is to investigate how people make quick judgments and avoid distractions

Procedures: In this research study you will be presented with various stimuli and asked to make judgments toward the stimuli. You will also be asked a series of questions about yourself, your attitudes, and goals. Participation will take 15 minutes for completion. Participation is completely voluntary and you are free to skip any questions that make you feel uncomfortable.

Risks of Participation: There are no known risks associated with this project that are greater than those ordinarily encountered in daily life.

Benefits: There are no direct benefits to participants.

Confidentiality: Your responses are completely confidential. The records of this research study will be kept private. Any written results will discuss group findings and will not include information that will identify you. Research records will be stored securely in North Murray 304 for 5 years and only researchers and individuals responsible for research oversight will have access to the records.

Compensation: You will receive ½ a research credit for your participation. You may also earn comparable credit by completing a comparable alternative assignment. Your instructor will provide details regarding the paper alternative.

Contacts: If you have any questions about this study, you may contact Thomas Hatvany (Thomas.Hatvany@okstate.edu). If you have questions about your rights as a research volunteer, you may contact Dr. Hugh Crethar, IRB Chair at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

Participant Rights: By signing below, you are indicating that your participation today is voluntary; you are free to withdraw at any time. You are also free to skip any question or task that you do not feel comfortable completing.

Signatures:

I have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form has been given to me.

_____ _____

Signature of Participant **Date**

Appendix C

PRACTICE:	CIRCLE YOUR RATING:
Practice 1	**Does Not Fit Me** ✦ **Does Fit Me**
Practice 2	**Does Not Fit Me** ✦ **Does Fit Me**

TRIAL:	CIRCLE YOUR RATING:
Trial 1	**Does Not Fit Me** ✦ **Does Fit Me**
Trial 2	**Does Not Fit Me** ✦ **Does Fit Me**
Trial 3	**Does Not Fit Me** ✦ **Does Fit Me**
Trial 4	**Does Not Fit Me** ✦ **Does Fit Me**
Trial 5	**Does Not Fit Me** ✦ **Does Fit Me**

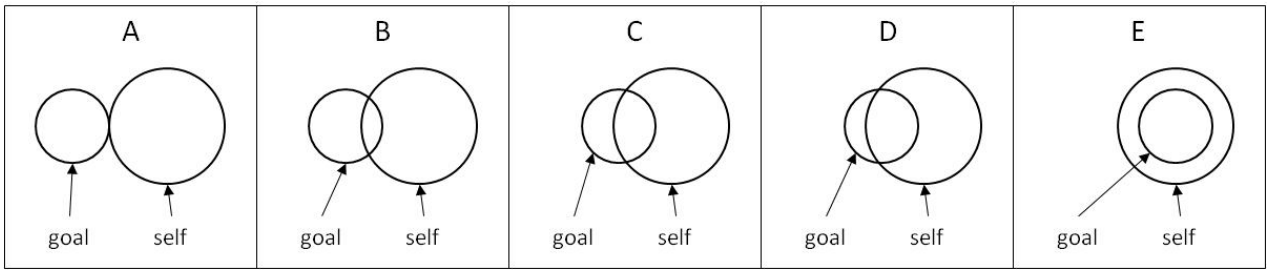
TRIAL:	CIRCLE YOUR RATING:
Trial 6	Does Not Fit Me ✦ Does Fit Me
Trial 7	Does Not Fit Me ✦ Does Fit Me
Trial 8	Does Not Fit Me ✦ Does Fit Me
Trial 9	Does Not Fit Me ✦ Does Fit Me
Trial 10	Does Not Fit Me ✦ Does Fit Me
Trial 11	Does Not Fit Me ✦ Does Fit Me
Trial 12	Does Not Fit Me ✦ Does Fit Me
Trial 13	Does Not Fit Me ✦ Does Fit Me
Trial 14	Does Not Fit Me ✦ Does Fit Me
Trial 15	Does Not Fit Me ✦ Does Fit Me
Trial 16	Does Not Fit Me ✦ Does Fit Me
Trial 17	Does Not Fit Me ✦ Does Fit Me
Trial 18	Does Not Fit Me ✦ Does Fit Me
Trial 19	Does Not Fit Me ✦ Does Fit Me
Trial 20	Does Not Fit Me ✦ Does Fit Me
Trial 21	Does Not Fit Me ✦ Does Fit Me
Trial 22	Does Not Fit Me ✦ Does Fit Me

TRIAL:	CIRCLE YOUR RATING:		
Trial 23	Does Not Fit Me	✦	Does Fit Me
Trial 24	Does Not Fit Me	✦	Does Fit Me
Trial 25	Does Not Fit Me	✦	Does Fit Me
Trial 26	Does Not Fit Me	✦	Does Fit Me
Trial 27	Does Not Fit Me	✦	Does Fit Me
Trial 28	Does Not Fit Me	✦	Does Fit Me
Trial 29	Does Not Fit Me	✦	Does Fit Me
Trial 30	Does Not Fit Me	✦	Does Fit Me
Trial 31	Does Not Fit Me	✦	Does Fit Me
Trial 32	Does Not Fit Me	✦	Does Fit Me
Trial 33	Does Not Fit Me	✦	Does Fit Me
Trial 34	Does Not Fit Me	✦	Does Fit Me
Trial 35	Does Not Fit Me	✦	Does Fit Me
Trial 36	Does Not Fit Me	✦	Does Fit Me
Trial 37	Does Not Fit Me	✦	Does Fit Me
Trial 38	Does Not Fit Me	✦	Does Fit Me
Trial 39	Does Not Fit Me	✦	Does Fit Me
Trial 40	Does Not Fit Me	✦	Does Fit Me

TRIAL:	CIRCLE YOUR RATING:
Trial 41	Does Not Fit Me ✦ Does Fit Me
Trial 42	Does Not Fit Me ✦ Does Fit Me
Trial 43	Does Not Fit Me ✦ Does Fit Me
Trial 44	Does Not Fit Me ✦ Does Fit Me
Trial 45	Does Not Fit Me ✦ Does Fit Me
Trial 46	Does Not Fit Me ✦ Does Fit Me
Trial 47	Does Not Fit Me ✦ Does Fit Me
Trial 48	Does Not Fit Me ✦ Does Fit Me

Instructions:
Answer the following questions in regards to the goal of <u>being healthy</u>

Instructions: Sometimes it feels like the goals we are pursuing are a part of who we are, that they are included in our self. With the goal **<u>being healthy</u>** in mind, please <u>circle the letter</u> for the picture that best represents how much this goal is included in your self or a part of who you are.



Please indicate the frequency you consume the following foods on the scale provided:

Potato chips

1	2	3	4	5	6	7
Never						Several times a day

Fries

1	2	3	4	5	6	7
Never						Several times a day

Chocolate

1	2	3	4	5	6	7
Never						Several times a day

Candy

1	2	3	4	5	6	7
Never						Several times a day

Ice cream

1	2	3	4	5	6	7
Never						Several times a day

Burgers

1	2	3	4	5	6	7
Never						Several times a day

Fast Food

1	2	3	4	5	6	7
Never						Several times a day

Pizza

1	2	3	4	5	6	7
Never						Several times a day

Please respond to the following statements for in relation to eating healthy: (SRHI for healthy eating, bold items are part of automaticity subscale)

Eating healthy is something I do frequently.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I do automatically.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I do without having to consciously remember.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something that makes me feel weird if I do not do it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I do without thinking.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something that would require effort not to do it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something that belongs to my (daily, weekly, monthly) routine.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I start doing before I realize I'm doing it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I would find hard not to do.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I have no need to think about doing.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something that's typically 'me'.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Eating healthy is something I have been doing for a long time

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Please circle the response that best fits you
Eating healthy is something that I…

1. Don't do
2. Do a few times per month or less
3. Do at least once a week
4. Do a few times per week
5. Do just about every day

Eating healthy is something that I…

1. Don't do
2. Rarely or never do at the same time of day
3. Sometimes do at the same time of day
4. Usually or always do at the same time of day

Eating healthy is something that I…

1. Don't do
2. Rarely or never do in the same place
3. Sometimes do in the same place
4. Usually or always do in the same place

How hard is it for you to get yourself to eat healthy?

1	2	3	4	5	6	7
Not hard at all, I do not have to use a lot of willpower to eat healthy						Very hard, I have to use a lot of willpower to eat healthy

How long does it take you to decide whether or not to eat healthy?

1	2	3	4	5	6	7
I don't have to think about it, I made the decision automatically						It takes me a while to make the decision

In general, how difficult is it to resist the temptation to do something other than eat healthy?

1	2	3	4	5	6	7
It is very easy to resist the temptation to do something other than eat healthy						It is very difficult to resist the temptation to do something other than eat healthy

In general, how often do you have to resist/overcome temptation to do something other than to eat healthy?

1	2	3	4	5	6	7
I never have to overcome the temptation to do something other than eat healthy						I always have to overcome the temptation to do something other than eat healthy

Please respond to the following statements in relation to exercise (SRHI for exercise, bold items are part of automaticity subscale)

Exercise is something I do frequently.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I do automatically.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I do without having to consciously remember.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something that makes me feel weird if I do not do it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I do without thinking.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something that would require effort not to do it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something that belongs to my (daily, weekly, monthly) routine.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I start doing before I realize I'm doing it.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I would find hard not to do.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I have no need to think about doing.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something that's typically 'me'.

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Exercise is something I have been doing for a long time

-3	-2	-1	0	1	2	3
Strongly Disagree		Slightly Disagree		Slightly Agree		Strongly Agree

Please circle the response that best fits you
Exercise is something that I…

1. Don't do
2. Do a few times per month or less
3. Do at least once a week
4. Do a few times per week
5. Do just about every day

Exercise is something that I…

1. Don't do
2. Rarely or never do at the same time of day
3. Sometimes do at the same time of day
4. Usually or always do at the same time of day

Exercise is something that I…

1. Don't do
2. Rarely or never do in the same place
3. Sometimes do in the same place
4. Usually or always do in the same place

How hard is it for you to get yourself to exercise?

1	2	3	4	5	6	7
Not hard at all , I do not have to use a lot of to exercise						Very hard, I have to use a lot of willpower to exercise

How long does it take you to decide whether or not to exercise?

1	2	3	4	5	6	7
I don't have to think about it, I made the decision automatically						It takes me a while to make the decision

In general, how difficult is it to resist the temptation to do something other than exercise?

1	2	3	4	5	6	7
It is very easy to resist the temptation to do something other than exercise						It is very difficult to resist the temptation to do something other than exercise

In general, how often do you have to resist/overcome temptation to do something other than to exercise?

1	2	3	4	5	6	7
I never have to overcome the temptation to do something other than exercise						I always have to overcome the temptation to do something other than exercise

During the past 7 days how many times did you do each of the following three types of exercise at least 30 minutes?"

1. Vigorous Exercise (examples include: running, jogging, swimming, aerobics, fast cycling, football, basketball). Please enter a numerical value_____

2. Moderate Exercise: (e.g., fast walking, dancing, gentle swimming, golf, heavy housework) Please enter a numerical value_____

3. Light Exercise: (e.g., walking at an average pace, table tennis, light housework) Please enter a numerical value_____

Please indicate how much each of the following statements reflects how you typically are.

I am good at resisting temptation.

1	2	3	4	5
Not at all				Very much

I have a hard time breaking bad habits.

1	2	3	4	5
Not at all				Very much

I am lazy.

1	2	3	4	5
Not at all				Very much

I say inappropriate things.

1	2	3	4	5
Not at all				Very much

I do certain things that are bad for me, if they are fun.

1	2	3	4	5
Not at all				Very much

I refuse things that are bad for me.

1	2	3	4	5
Not at all				Very much

I wish I had more self-discipline.

1	2	3	4	5
Not at all				Very much

People would say that I have iron self-discipline.

1	2	3	4	5
Not at all				Very much

Pleasure and fun sometimes keep me from getting work done.

1	2	3	4	5
Not at all				Very much

I have trouble concentrating.

1	2	3	4	5
Not at all				Very much

Please indicate how much each of the following statements reflects how you typically are.

I am good at resisting temptation.

1	2	3	4	5
Not at all				Very much

I am able to work effectively towards long-term goals.

1	2	3	4	5
Not at all				Very much

Sometimes I can't stop myself from doing something, even if I know it is wrong.

1	2	3	4	5
Not at all				Very much

I often act without thinking through all the alternatives

1	2	3	4	5
Not at all				Very much

To protect your identity, we will create a personalized ID and use this number, instead of your name, to link your data. To create this ID code, we need you to provide the following information:

1. What are your initials (<u>first</u> letter of first and last name)? _____ *(if name was Pistol Pete, put <u>P P</u>)*

2. What is your birthday date (Month, Day)? ___ ___--___ ___ *(e.g., if Jan 12, 1980 is your birthday, put <u>01</u>-<u>12</u>.*

3. What is your age (in years)? _____

4. Expected year of graduation _____

5. What is your sex?
   a. ___ Male b. ___ Female

6. Please list your approximate weight (pounds) _____ and height (feet and inches) _____

7. Number of hours spent per week watching TV _____

8. Out of the 21 meals (breakfast/lunch/dinner) most people eat per week how many of those meals do you eat healthy? _____

9. Which racial group best describes you (you may select more than one option)?
   a. ___ White/Caucasian
   b. ___ African American/Black
   c. ___ Latino/Latina/Hispanic
   d. ___ Native American/Alaskan Native
   e. ___ Asian/Pacific Islander
   f. ___ Other

10. Can you read Chinese?
    a. ___ No
    b. ___ Yes

11. Is English your first language?
    a. ___ Yes
    b. ___ No

12. Have you completed this study or one like it (i.e., with Chinese characters) in another class?
    a. ___No
    b. ___ Yes

Appendix D

Debriefing

Thank you for participating in this study.

In this study, you completed a task that flashed a word that was followed by a Chinese character and were asked to make a judgment about the Chinese character. Previous research has found that when people are asked to judge an ambiguous target (e.g., Chinese character), their judgment is influenced by the stimulus that precedes it, despite any attempts they make to remain unbiased. As a result, people's judgments of the Chinese character can be used to infer their implicit judgment of the preceding stimulus.

In this study, we wanted to measure people's implicit judgments regarding certain goals (e.g., health goals). As such, you were presented with words that were related to health (e.g., fitness) and neutral words (e.g., window). Your responses will allow us to see if some people implicitly feel these goals are "part of their self" more than other people. We then hope to use this data to examine which measures are best predictive of different behavior related to one's goals. We thank you for your participation in this study because your responses will help us determine if our measure is useful to other researchers.

Confidentiality is a big part of research. As we mentioned on the consent form, we maintain the confidentiality of our participants, but it is expected that participants maintain the confidentiality of the researchers as well. We will be conducting this research until the end of the semester so we ask that you not discuss this experiment with your friends or others who may participate in this study at a future date. You may unknowingly tell someone else who is scheduled to participate in this study, and this would ruin our findings.

If you were interested by this research and wish to learn more about it and other related research, please contact Thomas Hatvany (116 NM, Thomas.hatvany@okstate.edu). He will be happy to discuss this and any related projects with you.

If you have questions or concerns about your rights as a research subject you may contact, anonymously if you wish, Dr. Hugh Crethar, IRB Chair at 223 Scott Hall, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu.

VITA

Thomas Charles Hatvany

Candidate for the Degree of

Doctor of Philosophy

Thesis: IMPLICIT GOAL FUSION: THE PREDICTIVE POWER OF IMPLICIT MOTIVATIONAL MEASURES

Major Field: Experimental Psychology

Biographical:

Education:

Completed the requirements for the Doctor of Philosophy in Experimental Psychology at Oklahoma State University, Stillwater, Oklahoma in May 2018

Completed the requirements for the Master of Science in Experimental Psychology at Oklahoma State University, Stillwater, Oklahoma in July 2015.

Completed the requirements for the Bachelor of Arts in Psychology at Green Mountain College, Poultney, Vermont in May 2013.

Completed the requirements for the Bachelor of Science in Youth Development and Camp Management at Green Mountain College, Poultney, Vermont in May 2013.

Experience:

Graduate Teaching Assistant Fall 2013 to Spring 2018, Oklahoma State University, Stillwater, Oklahoma
Courses taught:
Experimental Psychology Lab section
Introduction to Psychology
Social Psychology
Quantitative Methods in Psychology
Psychology of Social Behavior

Professional Membership:
Society of Personality and Social Psychology
Oklahoma Psychological Society