Personalizing an Implicit Measure of Job Satisfaction

Brittany Boyd

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PERSONALIZING AN IMPLICIT MEASURE OF JOB SATISFACTION

by

BRITTANY BOYD

A dissertation submitted to the Graduate Faculty in Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy,

The City University of New York

2017
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This manuscript has been read and accepted for the Graduate Faculty in Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

Personalizing An Implicit Measure of Job Satisfaction

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Implicit attitude measures have become increasingly popular over the last two decades due to their ability to circumvent a number of the limitations of explicit measures and predictive validity evidence for certain behaviors that is superior to explicit measures. However, a number of improvements have been suggested, including personalizing the implicit measure to better capture the participant’s attitude, not their general evaluation of constructs involved. This paper examined implicit job satisfaction with a modified version of a pre-established measure (IAT; Boyd, 2010), proposed a new personalized measure (P-IAT), and examined the relationships of these measures with organizationally-relevant attitudes and behaviors, within a sample of customer service employees. The IAT was found to significantly correlate with the P-IAT, explicit job satisfaction, job involvement, and counterproductive work behaviors. Correlations between the IAT and both organizational citizenship behaviors and counterproductive work behaviors were enhanced when the respondent was asked to provide ratings from someone else’s perspective, instead of their own. This modification attempted to examine a more psychologically distant construct, for which implicit measures should be more strongly related than explicit. The P-IAT was only significantly related to the IAT and voluntary absence. The relationship between the IAT and explicit job satisfaction was moderated by time-related metrics (years of work experience, months in current role, and age). There was a positive correlation between the IAT and explicit job satisfaction amongst participants with lower time metrics, but
amongst participants with higher time metrics, there was no relationship.
Acknowledgements

I would like to thank my advisor, Dr. Charles Scherbaum, for all of your consistent support from my time with you as your research assistant in the Masters program all the way through my dissertation. You are a truly an outstanding leader and mentor. In addition, I would like to thank my committee members, Drs. Yochi Cohen-Charash, Loren Naidoo, Harold Goldstein, and Erin Eatough, and my chair, Charles Scherbaum, for their time, detailed feedback, and thoughtful questions to help to enhance this work. I also would like to thank the research assistants who helped me with data collection.

To my fellow Baruch colleagues, thank you for the support, comradery, and laughs along the way. I am grateful for these friendships, particularly those that I know will continue for many years to come.

To my family and friends, I am so grateful for all of the love and support throughout this process. Mom, so much of who I am today is because of you. As my first teacher, you provided me with a critical foundation of love, support, and a strong work ethic that has allowed me to pursue my dreams. I can never thank you enough. Peter, you have been my rock for a lifetime. Thank you for your encouragement over the years to help make this achievement possible. And last, but certainly not least, I thank my girls, Alexis and Nicole, for helping to give me perspective on what is truly important in this world. I hope to teach them that with perseverance, they can achieve their biggest dreams. For all the experiences and challenges that have led to this day, I am truly grateful.
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Chapter 1: Introduction

Over the past few decades, the domain of social cognition research has experienced an impactful shift in how information processing is conceptualized. The vast majority of current social cognition research has come to espouse a dual-process model of information processing, whereby effortless, automatic processing is differentiated from effortful, controlled processing (Payne & Gawronski, 2010). Researchers have used various terms for this dichotomy including implicit/explicit, automatic/controlled, and conscious/unconscious processing, which has contributed to confusion in some cases. However, the general agreement among social cognitive researchers is that there are two modes of processing information.

This model of information processing, which encompasses attitudes as well, developed in part from research findings that people do not necessarily have full access to their own thoughts or feelings. Their understanding of and ability to explore those thoughts and feelings may be restricted by the limitations of conscious processing (e.g., Nisbett & Wilson, 1977). Furthermore, even if people do have access to their thoughts and feelings, they may not be willing to accurately report their attitudes. Explicit (self-reported) attitude measures can be subject to manipulation by respondents through self-presentational biases such as socially-desirable responding (Paulhus, 1991) or demand characteristics (Orne, 1962). Over the past three decades, implicit attitude measures were developed to circumvent these limitations of explicit (self-reported) measures.

Implicit attitudes refer to influential past experiences that impact evaluation of social objects of which the respondent is not aware (Greenwald & Banaji, 1995). However, implicit attitude measurement can also access conscious attitudes that the respondent may not want to accurately report. In this sense, the implicitness is evidenced in the method, as the participant
may not be aware of what is being measured or have control over the direction or strength of the outcome. The appeal of measuring attitudes that respondents do not have access to or are not in control of the outcome has made implicit attitude measurement very popular in the last two decades (Payne & Gawronski, 2010; Rudman, 2011). Another reason for the quickly increasing popularity of implicit attitude measures is their ability to predict behavior more effectively than self-report measures in certain areas, particularly in socially sensitive domains (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). For example, implicit racial attitudes predicted nonverbal behaviors (e.g., amount of eye contact), whereas the explicit racial attitudes did not (Dovidio, Kawakami, & Gaertner, 2002).

Although implicit measurement has become quite popular, this area of research has been exposed to criticism and suggestions for improvement in both internal and construct validity domains (e.g., Blanton, Jaccard, Christie, & Gonzales, 2007). Given that implicit measures are relatively new, there continues to be both theoretical and methodological advances to improve these measures. For example, some internal validity concerns noted were the ordering of tasks within the measure and age of the respondent, both shown to influence the resulting implicit score (Greenwald & Nosek, 2001). Implicit researchers have responded to these concerns and have made adjustments to improve these measures, such as modifying procedures or the scoring algorithm to significantly attenuate these issues (e.g., Nosek, Greenwald, & Banaji, 2007).

One of the major criticisms of implicit measures relates to the construct validity. There have been questions about what these measures are capturing and whether extraneous influences are impacting the measurement outcome (e.g., Karpinski & Hilton, 2001). For example, Karpinski and Hilton suggested that environmental associations, culturally accepted but not individually accepted information, were captured in implicit measurement and are a source of
contamination. Olson and Fazio (2004) present a similar concept, "extrapersonal associations", although this information is not limited to cultural knowledge. Extrapersonal associations are available in memory, and thus may be captured in the implicit measurement of a particular concept, but do not influence the likelihood that an individual will personally experience a positive or negative reaction when encountering the object. For example, smokers may want to quit smoking and recognize society’s negative feelings towards smoking, yet they have strong positive associations when encountering a cigarette. Prior research had demonstrated that even smokers were found to have negative implicit attitudes towards smoking when using the standard implicit measurement (Swanson, Rudman, and Greenwald, 2001). However, Olson and Fazio (2004) proposed this was due to measurement contamination and captured extrapersonal associations, including generally held attitudes by the public, instead of only their own personal attitude towards smoking.

Olson and Fazio responded to this issue by modifying the implicit measure to be personalized such that the measure assesses the respondent’s evaluation of the construct instead of assessing their knowledge of publically held associations of the construct. They did this by altering the stimuli (changing the attribute labels from “Pleasant/Unpleasant” to “I like/I dislike” and removing error feedback) to focus on one’s own evaluation of an attitude object, rather than a general evaluation that may be capturing unwanted variance. This personalized implicit measure was found to be more strongly correlated with a related explicit measure than was the traditional implicit measure. Nosek and Hansen (2008b) evaluated this method and disagree with Olson and Fazio on the theoretical interpretation of the personalized implicit measure. Nosek and Hansen concluded that the increased correlation with explicit measures was due to procedural modifications that encouraged explicit evaluation of the construct, violating the
instructions for the original implicit task. However, what is agreed upon is that the alteration of the procedure focuses the respondent on evaluating the stimuli, thus providing a measure of their own implicit attitude of the specific construct, rather than categorizing the stimuli. Extensive further research needs to be conducted to explore the theoretical underpinnings of this personalization method. Thus, the current paper will examine this modified procedure to determine whether it can provide an initial contribution to further understanding respondents’ implicit attitudes.

Given the relatively new development of implicit measures, they have yet to be widely applied to certain domains, particularly in the area of organizationally-relevant attitudes (Scherbaum & Meade, 2009; Scherbaum & Meade, 2013; Uhlmann, Leavitt, Menges, Koopman, Howe, & Johnson, 2012). However, there may be great potential for application of these measures within organizational research given the many processes of which employees do not have full control or awareness, yet may impact their attitudes and behaviors (e.g., Uhlmann, Leavitt et al., 2012). Only a few studies have examined implicit attitudes generally in this domain (e.g., Ziegert & Hanges, 2005) or with job satisfaction specifically (e.g., Boyd, 2010; Leavitt, Fong, & Greenwald, 2011; Siers & Peters, 2011; Sumner & Haines, 2004) despite the popularity of job satisfaction research over the past 70 years (Brief & Weiss, 2002).

Boyd (2010) created a new measure of implicit job satisfaction and examined the relationships between it and a variety of self-report measures including explicit job satisfaction and other organizationally-relevant attitudes and behaviors, such as affective commitment, job involvement, organizational citizenship behavior, absence, lateness, and turnover intention. Statistically significant correlations were found between implicit job satisfaction and some of these explicit variables; however the magnitude of the correlations were in the lower range of
observed implicit-explicit correlations than in previous implicit research (e.g., Greenwald et al., 2009). One potential explanation for the lower correlations between the implicit and explicit measures is that the implicit measure of job satisfaction may have been capturing respondents’ attitudes towards work as a general concept or potentially was also reflecting society’s generally held view of work. If the respondent’s implicit attitude towards their own job could be more accurately captured, stronger correlations with related explicit measures may be observed.

The contribution of this paper is to further explore a new area of implicit research, specifically the effect of personalizing implicit measures, within the domain of job satisfaction. In this paper, a new personalized version of the Boyd (2010) implicit job satisfaction measure was created, which is a variant of the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Two studies were conducted to examine the preliminary construct validity evidence for this new personalized measure by assessing relationships with other implicit and explicit measures of job satisfaction, as well as relationships with other organizationally-relevant attitudes and behaviors. In the first study, initial construct validity was provided for this new personalized measure by conducting a full multi-trait multi-method study, utilizing confirmatory factor analysis techniques, to examine both convergent and discriminant validity evidence. In the second study, criterion-related validity evidence was examined by comparing the new personalized measure and the modified existing measure to measures of work-related variables, such as job involvement and withdrawal behaviors, as well as an indirect assessment of self-reported behavioral intentions. Additionally, the new measure was compared to existing measures of implicit and explicit job satisfaction, seeking additional validity evidence with a second sample of respondents. Thus, one of the major contributions of this paper was to create and explore new methods of assessing job satisfaction and work-related behavioral intentions.
Chapter 2: Implicit Attitudes

Implicit attitude measurement has quickly become an increasing popular area of research in social psychology over the last two decades (Payne & Gawronski, 2010; Rudman, 2011). The appeal of this type of measurement is supported both in theory and research evidence from many disciplines (Uhlmann, Leavitt et al., 2012). Theoretically, implicit attitude measures assess attitudes which the individual is either unaware of, unwilling to share publically, or does not have the ability to control the resulting score. Research has demonstrated these measures are able to circumvent several of the limitations of self-report methods (e.g., Gawronski, Deutsch & Banse, 2011) such as social desirability concerns, demand characteristics and the limitations of conscious introspection. Implicit measures have been used in a wide variety of domains to assess implicit social cognitions and individual differences. The predictive validity evidence of implicit measures for various outcomes has been demonstrated in many areas of research (Greenwald et al., 2009), further contributing to the appeal of these measures. Moreover, for certain types of behaviors, implicit measures have been found to have predictive validity evidence above and beyond explicit measures (e.g., Greenwald et al., 2009). Thus, implicit measurement is not only appealing in concept, but has been supported by research evidence as well. However, due to the relatively new development of this concept, all aspects of implicit measurement are not fully understood and it is not without limitations or criticisms. Before moving onto a discussion of the theoretical underpinnings or validity evidence of implicit attitude measures, it is important to address basic definitional issues of attitudes and implicit attitudes.

Attitudes

In 1935, Allport reviewed the attitude research, to date, and provided a definition which
was widely accepted for a long period of time: "An attitude is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (Allport, 1935, p. 810). An underlying assumption of this definition was attitude-behavior consistency. Thus, a challenge of this definition was the question of whether an attitude existed without the displayed behavior. Several decades later the tripartite theory of attitudes was introduced (e.g., Rosenberg & Hovland, 1960), which conceived of an attitude as being made up of three components: affect, cognition, and behavior. However, in more recent attitude research, an attitude is not conceived of being composed of these three components, rather it is an evaluative summary determined by information from each of these sources (Crites, Fabrigar, & Petty, 1994). Consequently, an attitude is no longer perceived to be critically dependent on the behavioral display in order to exist.

A common premise of various definitions of an attitude is the concept of an association. Although it had been assumed under other definitions of an attitude, Fazio, Chen, McDonel, and Sherman (1982) were the first to directly state that “an attitude can be viewed as an association between a given object and a given evaluative category” (p. 341). The association between the attitude object and a positive or negative valence will determine whether the response by the individual is positive or negative (Hughes, Barnes-Holmes & De Houwer, 2011). Moreover, the strength of that association will be reflected in the strength of the attitude (e.g., Crano & Prislin, 2006). Further, there is a theoretical assumption that attitudes play a role in determining behavior (e.g., Fishbein & Ajzen, 1975). This collective assumption of an underlying associative model has had a strong influence on attitudinal methodology and theory (Hughes et al., 2011).

Cognitive psychology research was exploring this idea of association from a neurological
perspective, proposing that the association between two concepts can be measured by the distance between these two concepts within the neural network of the brain from a spreading activation perspective (Collins & Loftus, 1975). Response latencies can provide an index to assess the distance between concepts and this area of research began to flourish in the 1980s (e.g., Fazio, Sanbonmatsu, Powell, & Kardes, 1986; Gaertner & McLaughlin, 1983). This area of response latency research was partially driven by a related concept proposed within cognitive psychology research, which was that information processing could be divided into controlled and automatic modes (Shiffrin & Schneider, 1977). Controlled processing requires significant attention and is voluntary, whereas automatic processing requires little attention and is not easy to regulate voluntarily. At the same time, social psychology research supported this concept of automatic processing as well. Nisbett and Wilson (1977) reviewed several studies concluding that individuals may not have the capability to consciously access some higher order processes, despite their effects on subsequent behavior.

Collectively, these lines of research lead to the beginning of a shift in conceptualization of attitudes. Theoretical advances and research on the neurological associations measured by response latencies, automatic versus controlled information processing, and the limitations of conscious access to higher order information processing, inspired the development of the concept of implicit attitudes.

Implicit Attitudes

As these new lines of research flourished, the concept of implicit attitudes was developed. Implicit attitudes are defined as “introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward social objects” (Greenwald & Banaji, 1995, p. 8). An individual may be unaware
of the attitude itself, the influential experience, or the degree to which the experience influenced his or her current attitude. Again, this concept of association that is central to the definition of an attitude is extended to implicit attitudes as well, underscoring the connection between an evaluative category and a given object. The association, or implicit attitude, is captured by implicit measurement techniques which self-report measures would not be able to capture. Thus, one of the major appealing features of implicit attitude measurement is the ability to circumvent several of the limitations of self-report methods.

**Self-report measures.** Self-report measures have provided valuable data to researchers for many years, which are not to be discounted; however, there are also a variety of known limitations of this method as well. Limitations range from social or cognitive influences on the individuals’ response to features of the instrument itself. Schwarz (1999) reviews a variety of issues that can influence data obtained through self-report measures such as wording, formatting, and context of both the question and/or response options. For example, Schwarz, Hippler, Deutsch, and Strack (1985) found that the distribution of response options influenced the frequency of reported behavior. Reported amount of daily television viewing increased when presented with a high-frequency scale versus a lower-frequency scale, as the respondents used the response alternatives as a frame of reference when estimating their own behavior. Social or cognitive influences on self-report measures include the limits of conscious introspection (Nisbett & Wilson, 1977), socially desirable responding (Paulhus, 1991), evaluation apprehension (Rosenberg, 1969), and demand characteristics (Orne, 1962), each of which are discussed further below. Although there is no doubt that self-report measures have provided a wealth of valuable data within social sciences research, it is important to understand the various external influences that these imperfect tools are subject to. Further understanding of these
issues and underlying cognitive processes can allow researchers to modify and improve measures, as well as present new alternative methods of measurement, to improve the quality of data.

Many different lines of research have demonstrated that humans are not always consciously aware of everything that affects their decisions, behaviors, or attitudes. Individuals may not be able to consciously access some higher-order processes. This lack of accessibility can appear at several levels: individuals may be unaware that an important stimulus exists, they may be unaware of their response, or they may be unaware of the influence of the stimulus on their response (Nisbett & Wilson, 1977). Further research has demonstrated how social cognition can unconsciously influence attitudes in particular (Greenwald & Banaji, 1995). Moreover, Gawronski, Hofmann, and Wilbur (2006) review several lines of research demonstrating how the same three possible levels of unawareness (source, content, and impact awareness) operate in attitudes, specifically. For example, an individual may be aware of the attitude but not aware of when or why it was established (source awareness). An example with an organizationally-relevant attitude may be level of perceived organizational support: an individual may have no opinion when asked how much he or she feels supported by the organization (content awareness). Alternatively, this individual may report feeling very supported by the organization, but not know exactly why he or she feels that way (source awareness). Given that self-report measures require an individual to report his or her own attitude, if he or she is not consciously aware of the attitude it is not possible to report it accurately. Many of our mental processes, including evaluative associations, are outside of conscious awareness (Bargh & Chartrand, 1999). They are not available through conscious introspection and self-report. Thus, researchers sought to find alternative methods of accessing
these evaluative associations through implicit, or indirect, measures. Implicit measures were developed to indirectly capture these associations.

Another concern with self-report measures is whether the attitude provided by the respondent is an accurate assessment of his or her attitude. A respondent may have the ability to access his or her attitude, but may be motivated to modify the response that is provided. This motivation can arise for a variety of reasons including socially desirable responding, evaluation apprehension, and demand characteristics. Social desirability is a form of response bias in which an individual’s tendency is to choose responses that make the respondent look good, as opposed to reflecting an accurate self-report (Paulhus, 1991; 2002). There may be two distinct concerns driving this socially desirable responding: the desire to look “good” to others (impression management), or to oneself (self-deception) (Paulhus, 1991; Zerbe & Paulhus, 1987). Either form of socially desirable responding can potentially influence a variety of organizationally-relevant attitudes, including job satisfaction which is the focus of this paper. For example, an individual may have a tendency to stifle the expression of dissatisfaction with one’s job because it may be seen as an admission of failure to others or to him or herself (Parker, 1967) or to others in the organization.

Other factors that may motivate respondents to alter responses are evaluation apprehension (Rosenberg, 1969) and demand characteristics (Orne, 1962). Respondents’ awareness of being evaluated may create some apprehension, which may in turn motivate respondents to alter responses in some way (Rosenberg, 1969). For example, if an individual was providing a rating of his or her own level of organizational commitment in a workplace survey, he or she may feel the need to provide a higher rating to be perceived in a positive light by the organization. Alternatively, the subtle cues provided to the respondent by the survey
administrator and the context in which the survey is completed, demand characteristics, may influence the respondent to alter his or her responses, attempting to provide a response the respondent believes the administrator desires (Orne, 1962). Thus, there are a variety of motivators that may influence an individual to provide an altered response on a self-report measure. One of the strengths of implicit measures is that they can capture attitudes without being subject to these limitations to the same degree.

**Implicit attitude measures.** Over the course of several decades, research has provided evidence that attitudes can guide behavior even when the individual is not aware of the influence of the attitude on behavior or the presence of the attitude itself has been available (e.g., Bargh & Chartrand, 1999; Gawronski et al., 2006; Nisbett & Wilson, 1977). For example, Devine (1989) found that when a stereotype is activated but the individuals’ ability to consciously monitor their response is precluded, when observing ambiguous behavior in a target, both high- and low-prejudice individuals construct stereotype-congruent evaluations. Therefore, when the ability to consciously monitor responses is removed, regardless of what the explicit or conscious attitude is, automatic or implicit attitudes may take precedence and guide behavior. Researchers sought to create measures that could capture these implicit attitudes that did not rely on the conscious self-assessment by the respondent.

Implicit measures provide a gauge of a social cognition or attitude (or an evaluative association of an object) even though respondents may not be conscious of the attitude or the measurement of it (De Houwer, 2005). Part of the complexity in defining implicit measurement is that there are different issues that can influence these measures: a) awareness of the attitude, b) motivation to distort the attitude, c) awareness of what is being measured, and d) ability to distort responses. First, implicit measures can assess attitudes that the respondent is completely or
partially unaware of. Second, there are a variety of factors that could influence the degree of motivation to provide a different response rather than their true attitude (e.g., social desirability). Third, a participant could be involved in study but not aware of what is being measured. This is a distinct issue from whether the participant is aware of the attitude. For example, participants could be aware of their own attitude towards a particular race, but not be aware that this attitude is being assessed by level of friendliness when they interacting with the experimenter of that race (e.g., McConnell & Liebold, 2001). Finally, the purpose of the task may be clear to the participant, but he or she does not have control over the size or direction of the resulting score.

Research has demonstrated across a variety of areas that implicit and explicit attitude scores differ, particularly in socially-sensitive contexts (Greenwald et al., 2009). However, it is not always clear which theoretical issue is being employed. The difference could reflect the lack of awareness of the attitude, what is being measured, or increased motivation to distort the attitude. Some research has focused on directly testing the last aspect – ability to distort responses. Implicit measures have been shown to be less susceptible to conscious attempts to modify or fake responses as well (e.g., Egloff & Schmukle, 2002; Steffens, 2004). Even when respondents are given instructions to “fake” their responses, it is more difficult to manipulate responses on an implicit measure than on an explicit measure (e.g., Steffens, 2004).

Despite a potential lack of conscious awareness of these attitudes, implicit attitudes can guide an individual’s thoughts and actions (e.g., Ziegert & Hanges, 2005), which can be activated outside of conscious control (Greenwald & Banaji, 1995), and can have a large influence on subsequent behaviors (e.g., Greenwald et al., 2009). In fact, in some situations implicit attitudes have been shown to be a stronger predictor of subsequent behaviors than explicit attitudes (Bargh & Chartrand, 1999; Greenwald et al., 2009). Through meta-analytic
techniques, Greenwald et al. (2009) found that implicit attitudes were more effective than explicit attitudes in predicting behaviors in socially sensitive domains such as prejudice and stereotyping. For example, Ziegert and Hanges (2005) found that discrimination in a hiring simulation was better predicted by an implicit measure of race preference than an explicit measure, when the work climate suggested that management endorsed a White race preference. Similarly, in a sample of physicians, an implicit measure of Black-White preference predicted subsequent medical treatment whereas the explicit measure of race preference did not (Green et al., 2007). Physicians with higher pro-White implicit bias were more likely to offer desirable treatment to White patients, while not treating Black patients. Thus, implicit measures are able to assess different aspects of attitudinal constructs than explicit measures, and in some cases provide superior prediction of behavior. Collectively, these strengths of implicit measures have made them quite appealing and contributed to their popularity (Nosek, Hawkins, & Frazier, 2011; Payne & Gawronski, 2010; Rudman, 2011). Although there are many benefits to implicit measurement, the limitations of implicit attitude measurement and the strengths of explicit attitude measurement should not be overlooked. In the current study, both types of measures will be used. Understanding both implicit and explicit attitudes is important in predicting future behavior with greater accuracy.

**Theoretical basis for the relationship between implicit and explicit measures.**

During the initial surge in the use of implicit measures, there was a great deal of focus on methodological and empirical evidence, leaving the theoretical basis somewhat neglected causing theoretical confusion amongst scholars (Fazio & Olson, 2003). Acknowledging this lack of theoretical agreement across perspectives, in recent years, several authors have focused on providing a deeper discussion of the theoretical underpinnings as well as clarity across the
various perspectives (e.g., Greenwald & Nosek, 2009; Hughes et al., 2011).

In an attempt to streamline the multiple perspectives, most of the research on implicit social cognition falls into two major categories: single-representation and dual-representation of implicit and explicit attitudes (Greenwald & Nosek, 2009). Different lines of research inspired these two different views. The single-representation view was inspired by cognitive psychology research on selective attention and short-term memory and focuses on automatic versus controlled cognitions; whereas, the dual-representation view was inspired by implicit memory research in cognitive psychology and focuses on conscious (explicit) versus unconscious (implicit) (Payne & Gawronski, 2010). One of the main distinctions between these views is their interpretation of the meaning of dissociation, when two types of measures do not strongly converge. This disassociation can take several forms including: a weak correlation, separation of their means or differing correlations with other variables (Greenwald & Nosek, 2009). Empirical data demonstrating dissociation has been interpreted in several different ways, which Greenwald and Nosek (2009) label as: single-representation and dual-representation, with a third category, person vs. culture, considered as a variant of the dual-representation view. In the following, I will review each of these views, as much of the previous implicit research omits discussing the theoretical underpinnings. The purpose of this section is to provide clarity about the theories that may be operating in this current research.

Single-representation interpretation of the implicit-explicit relationship. This view maintains that implicit and explicit attitudes are attributed to a single form of a mental attitude representation (i.e. object-evaluation association). The presentation of the attitude (automatic vs. non-automatic) depends on whether the individual experiences the motivation and opportunity to engage in effortful processing. Models from cognitive psychology have been used to develop
this single-representation view and help to further explain how implicit and explicit measures are related, which are some of the key relationships examined in this paper.

*Neural network of associations.* Fazio and colleague’s seminal work (Fazio, et al., 1986) drew from cognitive theories on automatic and controlled processing (e.g., Schneider & Shiffrin, 1977; Shiffrin & Schneider, 1977), and applied it to attitude activation. An automatic reaction does not require any reflection, is difficult to suppress, and occurs with well-learned associations. Conversely, controlled processing requires the active attention of the individual and is within the individual’s control (Fazio et al., 1986). The neural network model of the brain proposes that information is organized based on semantic relationships which are associations between concepts (McClelland, Rumelhart, & Hinton, 1986; Schneider & Shiffrin, 1977). The distance between the two concepts indicates the strength of the association (Collins & Loftus, 1975), of which response latencies can provide an index. The more strongly associated two concepts are in an individual’s mind, the faster the individual will respond to a pairing of these items. This concept set the stage for some of the response latency research in implicit measurement that gained popularity in the following decades. McClelland et al. (1986) describe a model called Parallel Distributed Processing (PDP) that explains how these connections are developed and strengthened with repeated exposure. Well-learned attitudes are strong and can be activated automatically as a result, but poorly learned attitudes do not.

*MODE model.* In addition to these models, Fazio (1990) proposed the Motivation and Ability as Determinants (MODE) model to explain conditions under which an automatic or deliberative process will take place when presenting an attitude. If there is either low motivation or opportunity, the stored attitude will be automatically activated and guide the response or behavior. Alternatively, if motivation and opportunity are high, deliberative processing may
alter the influence of the automatic attitude on the self-report measure. Dissociation is due to additional mental processing in presenting the attitude in the deliberative measure. As an organizational example, an individual’s job satisfaction may be low, with a low implicit score. However, when given a job satisfaction survey at work, the resulting score was higher. The dissociation may reflect concerns about his or her manager becoming aware of the results, thus altering the explicit job satisfaction score. From a single-representation view, the attitude of job satisfaction is the same in both measures; however, the explicit measure allowed for additional deliberative processing, thus creating the opportunity for dissociation.

Potentiated recruitment framework. Bassili and Brown (2005) describe a concept similar to the neural network and PDP models, which also reflects a single-representation view. In this potentiated recruitment framework, microconceptual networks (which are made up of associations between objects) infused with evaluative information are activated by objects, goals, or task demands. When relevant microconceptual networks are activated, the evaluation can be expressed explicitly or implicitly. If the evaluation is expressed explicitly, the evaluation must go through one additional step of being processed in the working memory. This last step provides the potential opportunity for modification and is what differentiates implicit and explicit attitudes. Thus, implicit measures are proposed to capture evaluations indirectly, before conscious filtering.

Collectively, these models provide the framework for the single-representation view of how implicit and explicit attitudes are related. However, as implicit attitude research has prospered, an alternative theoretical perspective has gained increasing popularity: dual-representation view.

Dual-representation interpretation of the implicit-explicit relationship. In this view,
implicit and explicit attitudes are proposed to be separate entities, reflected in distinct mental representations. This view is quite powerful and perhaps the dominant view currently in attitude research (Hughes et al., 2011). Implicit measures capture automatic and possibly unconscious mental representations, which are distinct from the conscious mental representations and deliberate thought that is captured with explicit measures (e.g. Greenwald & Nosek, 2009; Strack & Deutsch, 2004).

Like the single-representation view, this perspective also has roots cognitive theory, but in a different area, specifically implicit memory (Banaji, 2001). Implicit memory refers to the influence of past experience on later performance, despite not being conscious of the previous experience (Schacter, 1987). This lack of awareness is required for implicit memory, but not for the implicit attitude definition.

Similar to Fazio’s (1990) MODE model, Wilson, Lindsey and Schooler (2000) explain that the attitude endorsed will depend on whether the individual has the cognitive capacity to retrieve the explicit attitude and if it will override the implicit attitude. The major difference in this view is that implicit and explicit attitudes as “dual attitudes” and distinct constructs. Thus, in the organizational example provided earlier, discrepant scores on the implicit and explicit job satisfaction measures would be explained by concluding that the two attitudes are related but distinct constructs. An individual could have lower implicit job satisfaction and higher explicit job satisfaction as distinct attitudes, not attributable to the opportunity to deliberate.

Greenwald and Nosek (2009) also examine a third view, person vs. culture, in which it is espoused that explicit measures access personal attitudes, whereas implicit measures access non-attitudinal cultural or semantic knowledge. However, this perspective can be considered a variant of the dual-representation view. A further discussion of this person vs. culture view will
be presented in Chapter 4.

This dual-representation view has historically relied on construct validity evidence that implicit and explicit measures are related but distinct concepts by providing simultaneous convergent and discriminant validity evidence for related measures. However, Greenwald and Nosek (2009) propose that this type of behavioral evidence is not conclusive about the underlying theoretical structures, as discussed below.

**Reconciling the single- vs. dual-representation interpretations of the implicit-explicit relationship.** Greenwald and Nosek (2009) explain that although empirical data has been presented to demonstrate support for either of the perspectives (single- or dual-representation), this data does not and will never be able to prove either view as the correct one. The empirical dissociation corresponds to discriminant validity, indicating distinctness of empirical constructs (Cronbach & Meehl, 1955) through observable data. The structural dissociation which is the underlying theoretical debate refers to the distinctness of hypothesized mental representations. Unfortunately, Greenwald and Nosek (2009) conclude that there is no possibility for behavioral evidence to provide a definitive answer as to which of the interpretations is correct. Instead, whether implicit and explicit attitudes are conceived as single- or dual-representation may be decided based on the resulting theory’s explanatory power and level of parsimony.

Although there may be various underlying differences in the theoretical models of implicit attitudes, there is agreement that implicit attitudes are important to explore and have unique predictive validity for certain types of behaviors. Moreover, there has been a call to apply these implicit measures to organizational domains to further enhance our understanding of their application (e.g., Becker & Cropanzano, 2010; Scherbaum & Meade, 2013), as implicit measures have been previously under-represented in this domain (Uhlmann, Leavitt, et al.,
Thus, although this debate cannot be resolved at this time, it does not prevent moving forward with the goals of the current study: to explore alternative measures for implicit job satisfaction. However, it is important to understand the current state of the literature and debate around the theoretical basis of implicit measures to guide interpretations made from empirical data.
Chapter 3: Measuring Implicit Attitudes

Nosek, Hawkins, and Frazier (2012) open their review of implicit measures by stating, “A disquieting answer to the question ‘What is implicit?’ is that there is no correct answer” (p. 31). This statement is based on the fact that implicit attitudes are psychological constructs and thus unobservable; therefore, theories and definitions of concepts are only based on available evidence. Given the relative new development of implicit measures, they are still subject to much debate within the theoretical and methodological realms. As discussed in Chapter 2, there are a variety of perspectives on implicit measures from a theoretical viewpoint without a conclusive resolution. Similarly, there are many alternatives from a methodological perspective as well, providing a great opportunity for research and discussion.

As discussed, implicit attitudes are the associations of concepts in one’s mind. The goal of implicit attitude measurement is to quantify the degree of association. Initial attempts at implicit attitude measurement began in the early 1980s and were mostly based on assessing response latencies, with shorter latencies representing stronger associations between concepts. In the late 1990s, the IAT (Greenwald et al., 1998) was introduced which is also based on measuring response latencies through a computer-based sorting task. The IAT surged in popularity due to its ease of administration and substantial validity evidence (e.g., Greenwald et al., 2009; Nosek & Hansen, 2008a).

With the rapid increase of implicit measurement, scholars in the field noted the need to better explicate a definition of these measures (e.g., De Houwer, 2005). These methods do not rely on the ability of an individual to introspect and determine his or her level of attitude in the context of a particular rating scale, thus circumventing constraints of self-report methods, such as the limits of conscious introspection and socially-desirable responding. Not only are there a
wide variety of implicit techniques (Uhlmann, Leavitt et al., 2012), but implicit measures also vary in their operationalization as well. Thus, it has been challenging for scholars to find a collectively agreed upon definition of the term “implicit measurement”.

Bargh (1994) differentiates various implicit measures from explicit measures by noting that implicit measures have at least one of the following: reduced controllability, lack of intention, reduced awareness of the origins, meaning, or occurrence of a response, or high efficiency of processing. De Houwer (2005) clarifies that an implicit measure assesses an attitude where the participant is either not aware that the measurement is occurring, does not have conscious access to the attitude, or does not have control over the outcome of the measurement. There are a wide variety of methods to capture implicit attitudes including response latencies, word fragment completion tasks, preference of certain letters, and various physiological approaches (Fazio & Olson, 2003; Uhlmann, Leavitt et al., 2012). However, in more recent research the IAT and its variants are by far the most popular approach (e.g., Nosek et al., 2011), which are all based on the response latency method.

**Beginnings of Implicit Measurement Utilizing Response Latencies**

Gaertner and McLaughlin (1983) were one of the earliest researchers to use the response latency technique. In an attempt to measure automatic racial stereotypes, they presented the words “black” or “white” to participants prior to a lexical decision making task in which participants had to identify different words. Gaertner and McLaughlin found that respondents identified positive words (e.g., “smart”) as words more quickly when they were primed with “white” rather than “black”, indicating automatic stereotypes. These findings provide an example of initial research using response latencies to assess implicit attitudes.

Another earlier pioneer in developing implicit measures based on response latency
techniques was Fazio (e.g., Powell & Fazio, 1984). In Fazio and colleagues’ early work (e.g., Blascovich et al., 1993; Fazio & Williams, 1986; Fazio et al., 1986; Fazio, Jackson, Dunton, & Williams, 1995), they measured the speed at which respondents were able to provide answers to various attitudinal questions, postulating that the response latency represented how accessible that attitude was to an individual. Fazio and colleagues used this measure of attitude accessibility to explore attitude-perception and attitude-behavior relationships (e.g., Fazio & Williams, 1986).

The concepts of attitude accessibility and the underlying associations provide the groundwork for understanding implicit attitudes. In 1986, Fazio et al. proposed a model of attitude strength, where having little experience or association with an object would be considered a “nonattitude” at one end of the continuum and at the opposite end, well-learned associations are considered “attitudes.” The evaluative dimension or the valence of the actual response (e.g., agree, disagree) is the second critical component of attitude accessibility, as the response latency does not make any assumptions regarding the direction of the attitude. Together, associative strength and valence determine level of attitude accessibility, with highly-accessible attitudes garnering shorter response latencies. Using job satisfaction as an example, if an individual has both a strong evaluation of his or her job satisfaction (e.g., feels very satisfied or dissatisfied about work) and is towards the “attitude” end of the attitude/nonattitude continuum (i.e., has thought a great deal about his or her level of job satisfaction and has a more crystallized attitude), then this individual will most likely respond very quickly to questions regarding his or her job satisfaction. However, valence of the attitude (job satisfaction or dissatisfaction) would also have to be assessed in order to determine the implicit attitude of job satisfaction. Although a participant may be aware of what is being measured by response latency
measures, it is difficult to control or influence the response when required to provide it as quickly as possible.

Fazio et al. (1982) found that attitude accessibility (defined by shorter response latencies) moderated the attitude-perception and attitude-behavior relationships, such that stronger correlations were observed as attitude accessibility increased. Relating these findings back to the job satisfaction example given above, an individual who has a strong and positive evaluation of his or her job satisfaction should be more likely to have positive perceptions of the workplace and possibly interpret work events more positively than if he or she were dissatisfied with his or her current job.

Once this groundwork was established for the development of implicit measurement, other researchers incorporated additional techniques into the assessment of automatic attitudes. For example, the priming method operates through a process called the spread of activation (Collins & Loftus, 1975). The mere presentation of an object can automatically activate the attitude associated with this object if the attitude is strong (Fazio et al., 1986) and related information is subsequently processed more easily and quickly.

For example, Fazio et al. (1995) investigated the effect of priming on implicit racial attitudes by assessing response latencies of a pairing task. Participants completed a computer-based task in which they were asked to label words “good” or “bad” as quickly as possible, which was then combined with presentation of faces of a particular race. Fazio et al. found that positive associations with a race (as measured by self-report) facilitated shorter response latencies for evaluating positive words after being shown a face of that particular race and photos of a person with a negatively associated race facilitated shorter response latencies for evaluating negative words. In this method of sequential evaluative priming, the purpose of the task is not
directly apparent to participants and the response latency is difficult to control.

**Implicit Association Test**

Introduced in 1998, the IAT (Greenwald et al., 1998) assesses the strength of automatic associations between concepts in one’s memory. Similar to Fazio et al.’s (1995) method above, the IAT measures responses latencies to pairing of words in a computer-based task. As a result of its ease of administration, applicability to a variety of domains, and predictive validity of the scores on this measure for a variety of behaviors (e.g., Greenwald et al., 2009), the IAT has quickly become the most popular implicit measure used today (Fazio & Olson, 2003; Nosek et al., 2011). In fact, Olson and Fazio (2004) noted that although areas of research have become popular at different times in history, it is rare that a particular measurement tool has become the center of such an intense surge of research. As a result of its popularity, the IAT has provided the bulk of research and validity evidence to date (Nosek et al., 2011), which is reviewed in the validity section below.

The IAT is a computer-based task in which the association between a target category (e.g., Republican vs. Democrat) and an attribute (e.g., positive vs. negative) is assessed by measuring response latencies when the two items share the same response key. Within the task there are several trials that require a participant to categorize stimuli representing either the target category or the attribute (e.g., donkey, elephant, pleasant, unpleasant) into either of two target/attribute groups (e.g., Republican and positive versus Democrat and negative). For example, a correct participant response to the stimulus “elephant” is to press the key on the computer keyboard that belongs to the “Republican and positive” category because an elephant represents the Republican political party. Similarly, “unpleasant” would be associated with the “Democrat and negative” category because unpleasant represents a negative word. The
combination of the target/attribute pairing is then reversed (e.g., Republican and negative versus Democrat and positive) and the stimuli are presented again. A shorter response latency for one pair (e.g., Democrat and positive) versus another (e.g., Republican and positive) represents a stronger association between that object and attribute as opposed to the other. Advantages of the IAT are that it is not readily apparent what is being measured, inability to fully control speed of response as it is measured in milliseconds, and lack of susceptibility of faking responses. Two variants of the IAT are examined in this paper.

**Construct Validity Evidence of Implicit Measures**

Although implicit measures are a relatively recent development, the swift popularity of these measures has provided a substantial amount of construct validity evidence of the scores in support of these measures (e.g., Fazio & Olson, 2003; Greenwald et al., 2009). However, the additional evidence continues to be sought, particularly as these measures evolve and are applied to new domains (e.g., organizational sciences; Becker, Cropanzano, & Sanfey, 2011). A variety of methods have been used to provide construct validity evidence including known groups approach, comparing explicit and implicit measures to establish convergent and discriminant validity evidence, and behavioral predictions (e.g., Greenwald et al., 2009), reviewed below.

**Known groups approach.** Several authors (Fazio & Olson, 2003; Greenwald & Nosek, 2001) provide a review of findings from various studies that have used the known differences between groups method to develop evidence of the construct validity of scores from implicit measures. For example, Japanese Americans and Korean Americans were found to differ in their implicit attitudes, with more positive attitudes towards their own ethnic group (Greenwald et al., 1998). Expected differences were also found between homosexual and heterosexual men with respect to sexual arousal towards male or female stimuli (Snowden & Gray, 2013), men and
women with respect to both their implicit gender self-concepts (Greenwald & Farnham, 2000) and self-concepts relating to mathematics, where women showed stronger relationships between both positive valence and arts, and self and arts, relative to math (Nosek, Banaji, & Greenwald, 2002). This known group differences method has also been employed in predicting behavioral differences between groups. For example, implicit measures predicted differences in behavior as expected for smokers and nonsmokers (Swanson et al., 2001), snake phobics and spider phobics (Teachman, Gregg, & Woody, 2001), and vegetarians and omnivores (Swanson et al., 2001).

**Convergent and discriminant validity.** As noted earlier, there is much debate whether the implicit-explicit relationship is best represented by a single- or dual-representation interpretation. From either viewpoint, implicit and explicit measures of the same construct should be both related and distinct according to a multi-trait multi-method (MTMM) perspective (Campbell & Fiske, 1959). Moreover, implicit measures attempt to capture the individual’s attitude at an earlier stage of processing than explicit measures (e.g., Bassili & Brown, 2005); thus, the attitude that is captured with an implicit measure should be different than the explicit measure, as it does not require a further stage of mental processing which may allow for extraneous influences to be captured in the attitude measurement such as social desirability concerns. Therefore, explicit and implicit attitude measures of the same construct should provide both convergent and discriminant validity evidence, from both single- and dual-representation perspectives.

For example, Gawronski (2002) found an implicit measure designed to assess negative associations related to Turkish individuals had a significant positive relationship with explicit measures of prejudice towards Turkish individuals \(r = .37\); similarly, an implicit measure assessing negative associations with East Asians was significantly related to an explicit measure
of prejudice against East Asians ($r = .32$), providing convergent validity evidence. Furthermore, discriminant validity evidence was found when the implicit Turkish measure was found to be unrelated to the explicit East Asian measure, and the implicit East Asian measure was found to be unrelated to the explicit Turkish measure.

Advanced statistical techniques have contributed validity evidence as well. Using structural equation modeling and a MTMM approach, Nosek and Smyth (2007) found evidence for both convergent and discriminant validity between the implicit attitude measure and the corresponding self-report measure. The best fitting model found was a two factor model where the implicit and explicit measures of the same attitude were related but independent, as opposed to a single factor model of attitude structure. A meta-analysis of studies examining implicit and explicit measures across various domains by Hofmann, Gawronski, Gschwender, Le, and Schmitt (2005) reached the same conclusion, with a mean corrected implicit-explicit correlation of $r = 0.24$. Similarly, a confirmatory factor analysis by Fazio et al. (1995) found that obtrusive and unobtrusive measures of racial prejudice were related but distinct. Cunningham, Preacher, and Banaji (2001) found that although implicit and explicit measures were correlated, thus related, the measures contributed unique sources of variance and did not form a single latent factor, providing support for their distinctness.

Additional studies have investigated convergent validity of scores on different types of implicit measures as well. Cunningham et al. (2001) found that although bivariate correlations between the individual implicit measures were rather low, a confirmatory factor analysis provided a much stronger relationship between the latent constructs of the implicit measures (mean $r = .63$). This evidence further supports the notion that various implicit measures are attempting to assess the same construct as the respective explicit measure of the construct of
interest through different methods.

**Behavioral prediction.** The ability of implicit measures to predict behavior more effectively than self-reports in certain domains, particularly in socially sensitive domains, contributes to the popularity of implicit measures. In fact, the number of studies examining the predictive validity of implicit measures have warranted several reviews (Friese, Hofmann, & Schmitt, 2008; Perugini, Richetin, & Zogmaister, 2010) and a meta-analysis (Greenwald et al., 2009) to synthesize the findings. However, evidence suggests that additional relationships exist as well, where implicit measures can be beneficial in predicting controlled behaviors, or when used in addition to explicit measures.

Implicit measures are particularly useful when attempting to predict behaviors that are automatic, difficult for the individual to control (e.g., eye contact with a partner, Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997), spontaneous (e.g., reactions to unexpected bad news, Steffens & Konig, 2006), or measured without the participant’s awareness. For example, Fazio et al. (1995) examined level of friendliness and interaction with a Black experimenter as the behavioral criterion and found that implicit attitudes towards Blacks were a better predictor of the criterion than explicit attitudes. Support for the predictive ability of implicit measures has also been demonstrated across a wide variety of areas including personal (e.g., addiction-related behaviors, perceived symptom severity) and professional realms (e.g., sports performance, ethical decisions in the workplace) (for a review see Nosek et al., 2012; Perugini et al., 2010).

**Behavioral prediction within the organizational domain.** Implicit measures of job satisfaction may help to explain a greater portion of the relationship between the attitude of job satisfaction and organizationally-relevant behaviors when used in conjunction with explicit measures, especially if the employee perceives the situation to be socially-sensitive or is not
aware that the behavior is being measured. When the criterion measure is a consciously controlled behavior, but is not socially sensitive (e.g., voting behavior, brand-related choices, transparent self-ratings of behavior), explicit measures have been shown to be better predictors than implicit measures (e.g., Karpinski, Steinman, & Hilton, 2005; Steffens & Konig, 2006). Rydell, McConnell, Mackie, and Strain (2006) found that presenting consciously accessible behavioral information influenced subsequent explicit attitudes but not implicit attitudes. However, implicit measures have been found to be significantly related to conscious behaviors as well, such as voting behavior (Galdi, Arcuri, & Gawronski, 2008) and suicide attempts (Nock et al., 2010). Implicit measures have been demonstrated to be superior predictors of certain criteria compared to explicit measures within the organizational domain as well (e.g., Ziegert & Hanges, 2005). For example, implicit biases of hiring managers predicted the likelihood of inviting job applicants for an interview better than explicit measures across several types of bias such as Arab-Swedish (Rooth, 2010) and Obese-Thin (Agerström & Rooth, 2011). Although these decisions are within conscious control, they are within a socially-sensitive domain and participants may be unaware of the relevance of the behavior.

Both implicit and explicit measures have been shown to be useful in predicting behavior, which is enhanced when the correspondence between the two is strong, regardless of the domain Greenwald et al. (2009). A meta-analysis revealed that both types of measures explained incremental variance above and beyond the other measure in the prediction of behaviors; thus, using both implicit and explicit measures is recommended to obtain a more comprehensive understanding of an attitude and explain unique variance in the outcome variable of interest. The current study incorporates this advice by exploring the relationships between both types of measures.
Limitations of Implicit Measures

Despite the previous evidence of validity, it should be noted that implicit measures have been subjected to a variety of internal and construct validity criticisms (e.g., Blanton, Jaccard, Christie, & Gonzales, 2007; Brendl, Markman, & Messner, 2001; Rothermund & Wentura, 2004). The criticisms have been directly addressed by researchers using implicit measures and many of the problems have been attenuated or solved (e.g., Nosek, Greenwald, & Banaji, 2007); however, there are still criticisms of the implicit measures that have not been completely resolved, which is reflected in the continuing debates (e.g., Blanton et al., 2009).

**Internal validity criticism.** Several internal validity criticisms of implicit measures have been noted including reliability, influence of familiarity with the implicit measure, selection and design of stimulus materials, context effects, and fakability (e.g., Blanton et al., 2007; Fiedler & Bluemke, 2005; Rothermund & Wentura, 2004). Researchers who use implicit measures have responded to all of these internal validity issues and some of the issues have been resolved or improved (e.g., Nosek et al., 2007).

**Reliability evidence.** One area of concern is that the reliability evidence of implicit measures is highly variable depending on the type of measure, and thus is relatively weak compared to other psychological measures (Nosek et al., 2007). The strength of the validity evidence for these measures is therefore constrained by this reliability evidence. Bosson, Swann, and Pennebaker (2000) investigated various implicit self-esteem measures and found a range of test-retest reliabilities from \( r = -.05 \) for the Stroop task to \( r = .69 \) for the IAT (Greenwald et al., 1998). Implicit measures can vary greatly on several factors such as the degree to which the individual is aware of what is being measured and the degree of control over the measurement outcome. Thus, it is important to assess and consider the reliability evidence of the particular
implicit measure chosen for use. Research that is conducted with an implicit measure demonstrating low test-retest reliability may demonstrate weak validity evidence. The current paper will use a variant of the IAT, which displayed the best test-retest reliability evidence of the implicit measures considered by Bosson et al. (2000). In addition, Nosek et al. (2007) report a stable test-retest reliability (median $r = .56$) across several studies using the IAT. Moreover, Banaji (2001) notes that lower levels of reliability evidence are not unique to this area of study. Low levels of reliability that are found in implicit memory measures, which tends to be a more established and accepted area of research, have not been a significant impediment to ongoing research in this field.

Selection and design of stimulus materials. The stimulus materials can also significantly influence the obtained measure of the implicit attitude (Nosek et al., 2007). For example, to increase internal validity of scores on the IAT, the stimuli representing categories should be strongly and accurately representative of the category, not easily associated with the other categories in the measure, and contain only relevant features to represent the category, not extraneous features that may be confusing (Nosek et al., 2007). Therefore, selecting stimuli that are not clearly appropriate for the category of interest can decrease internal validity of scores.

Cognitive fluency, age, and experience. Other criticisms of implicit measures from an internal validity perspective include cognitive fluency, age of the individual, and experience with the implicit measurement tool. Cognitive fluency refers to the individual’s ability to switch between tasks (Nosek et al., 2007), which is a required feature of the IAT. Individuals who are low in this ability tend to perform the task slower overall which creates larger implicit measurement effects than individuals who complete the task more quickly (e.g., McFarland & Crouch, 2002). Secondly, research has demonstrated that older adults often obtain larger implicit
measurement scores, which may be related to the issue of cognitive fluency (Greenwald & Nosek, 2001). Finally, research has shown that increasing the number of administrations of the same implicit measure tends to decrease the observed effect (e.g., Greenwald, Nosek, & Banaji, 2003). The extraneous effects of all three of these criticisms have been markedly reduced by a revised scoring algorithm for the IAT (Greenwald et al., 2003). Greenwald et al. compared several different variants of the algorithm to determine which would be most effective in resolving some of the existing issues with the IAT. The improved scoring algorithm was selected because it displayed superior performance on several criteria. For example, it demonstrated stronger correlations with explicit measures and improved internal consistency. The implicit-explicit correlations were also less affected by various statistical artifacts related to speed of responding, the combined order of tasks, and prior experience taking an IAT. Although these extraneous influences are not completely removed by the revised scoring algorithm, they are attenuated to a large degree.

Context effects. Another internal validity criticism of implicit measures is context effects (Blair, 2002). Explicit or self-report measures are widely known to be subject to a variety of context effects (e.g., Carlston & Smith, 1996; Rivers, Meade, & Fuller, 2009). When implicit measures were initially introduced, a promising possibility was that they represented “true attitudes” that were not subject to context effects or conscious manipulation (Bassili & Brown, 2005). However, subsequent research has shown that implicit measures are susceptible to several types of context effects (e.g., Blair, 2002; Wittenbrink, Judd, & Park, 2001). Blair (2002) provides a review of several studies indicating several sources of context effects on implicit measures including social motives, configuration of stimulus cues, and the individual’s focus of attention.
For example, Wittenbrink et al. (2001) found that White participants’ implicit attitudes toward Blacks varied depending on which video the participant was exposed to preceding the implicit measure (positive stereotypic depiction: family barbecue; negative stereotypic depiction: a gang incident). However, these findings make sense in the context of spreading activation (Collins & Loftus, 1975). An attitude towards a racial group is complex, containing different components, some of which may be conflicting (i.e., positive and negative aspects). Similarly, the measurement of job satisfaction may vary depending on what types of stimuli are included (e.g., items representing global job satisfaction versus facet satisfaction). As discussed above, choosing stimuli that have multiple or irrelevant features associated with different categories can lead to variations in implicit scores based on individuals’ interpretation of the stimuli (Nosek et al., 2007). Accordingly, it is beneficial to select stimuli that only contain features relevant to the implicit attitude of interest, a suggestion that was followed in the current research.

Given that implicit attitudes are less consciously accessible than explicit attitudes, research has demonstrated that they are much less susceptible to intentional efforts to alter implicit attitudes (e.g., Egloff & Schmukle, 2002; Steffens, 2004). However, this is not to say that implicit attitudes are completely stable and unalterable. Implicit attitudes have also been shown to be malleable depending on the type of mental activity preceding the measurement of the implicit attitude. For example, Blair, Ma, and Lenton (2001) found that the strength of stereotypic associations could be reduced by having participants engage in counter stereotypical mental imagery (i.e., imagine a strong woman and her capabilities). Gawronski and Strack (2004) found that cognitive dissonance changes explicit attitudes, but not implicit attitudes in a classic cognitive dissonance experimental paradigm. Participants were instructed to write counter attitudinal essays and on subsequent explicit measures individuals’ attitudes were more
positive to the counter attitudinal position if the situational pressure to write the essay was low, but not if the pressure was high. The implicit attitudes toward the counter attitudinal position did not change, regardless of level of situational pressure. This line of research provides evidence that although implicit measures may not be completely immune to context effects, it appears that they are less susceptible to context effects than explicit measures.

Recent research indicates that the type of information provided to the individual prior to the task may differentially influence implicit and explicit attitude measures. As mentioned earlier, Rydell et al. (2006) found that explicit attitude measures were more susceptible to influence by verbally stated, consciously accessible behavioral information; whereas, implicit measures were more susceptible to influence by subliminal primes. Accordingly, one must consider the nature of potential context effects on both implicit and explicit measures of interest and test for the influence of these extraneous influences.

Faking. A final internal validity criticism of implicit measures is the ability of a participant to consciously influence, or “fake”, the results of the implicit measure. Several researchers have demonstrated the susceptibility of implicit measures to this intentional influence by participants (e.g., Fiedler & Bluemke, 2005; Kim, 2003). General instructions to fake are not very influential on resulting implicit measurement scores (e.g., Kim, 2003) and participants rarely create a successful faking strategy on their own (Cvencek, Greenwald, Brown, Snowden, & Gray, 2010). However, implicit measurement scores are much more susceptible to influence when the individuals are specifically instructed how to fake the results (i.e., slow down responding on a particular critical trial) or if the individual has had previous experience with the implicit measure (Kim, 2003; Nosek et al., 2007). Although implicit measures are not immune to the intentional altering of results, it is difficult to do so (Egloff & Schmukle, 2002; Schnabel,
Banse, & Asendorpf, 2006; Steffens, 2004). Making them much less susceptible than explicit measures which is a clear strength. Moreover, research continues to make progress in reducing the impact of faking and to identify when faking occurs and to what degree (e.g., Cvencek et al., 2010). For example, Conrey, Sherman, Gawronski, Hugenberg, and Groom (2005) have proposed a model to disentangle various influences on the implicit measurement score in order to identify what variance results from activation of the implicit attitude by the stimulus versus variance due to extraneous influences (e.g., guessing, faking).

In sum, many of the legitimate internal validity criticisms of implicit measures have been addressed and resolved or attenuated by implicit attitude researchers. Of the remaining criticisms, research has demonstrated that although these limitations still exist, implicit measures appear to be an improvement over explicit measures in certain ways (e.g., ability to fake responses).

**Construct validity criticism.** Although much of the early criticism of implicit measures relates to measurement issues and internal validity concerns (e.g., Banaji, 2001), more recent criticism focuses on conceptual or construct validity concerns (e.g., Blanton et al., 2007; Rothermund, Wentura, & De Houwer, 2005). Construct validity criticisms include issues of salience asymmetry (e.g., Rothermund & Wentura, 2004), whether the implicit scores reflect the individual’s attitude or society’s views (e.g., Karpinski & Hilton, 2001), and whether implicit attitude scores can be broken down into components (Blanton et al., 2007).

**Salience asymmetry.** The issue of salience asymmetry raised by Rothermund and Wentura (2004) refers to the idea that implicit measure scores reflect the salience of the stimuli rather than associations. For example, the flower-insect IAT requires individuals to pair the categories of flower and insect with the attributes of pleasant or unpleasant. Rothermund and
Wentura claim that the salience (i.e., degree to which the item stands out; is more prominent or noticed that the other items) influences the resulting implicit measure score. Therefore, if insect is more salient than flower, and unpleasant is more salient than pleasant, the individual will have an easier time responding to insect-unpleasant pairing because both stimuli are salient, not because there is an association between the two. However, Rothermund and Wentura’s approach violates the guidelines for appropriate usage of the IAT (Greenwald & Nosek, 2001) by using nonsense words, unknown names, or unrelated neutral words as stimuli in their research. Despite this, Greenwald, Nosek, Banaji, and Klauer (2005) did agree that salience asymmetry could influence the resulting implicit attitude score, but this influence is not greater than the extraneous influence that results from selecting stimuli that can be categorized in multiple ways, which they have cautioned against.

Cultural knowledge. Another construct validity criticism of implicit measures is the question of whether the implicit attitude scores reflect the associations held by the individual or by the environment (e.g., culture, society) in which the individual resides (e.g., Karpinski & Hilton, 2001). A more detailed review of the debate on the influence of cultural knowledge follows in Chapter 4.

Measure of relative preference. A final construct validity criticism raised by Blanton and colleagues (Blanton, Jaccard, Gonzales, & Christie, 2006; Blanton et al., 2007) focusing on whether the IAT measures relative preference between two target categories (essentially creating a new attitude object) or if the IAT is just measuring the difference between attitudes towards two target categories. Blanton et al. (2006) criticize the IAT on the basis that it is limited to understanding an attitude only in relation to another construct (e.g., Black-White attitude is the comparative attitude towards Blacks in relation to Whites, not just an independent attitude
towards Blacks). Nosek and Sriram (2007) agree that this limitation is a well-known feature of the IAT and the measured attitude is a relative preference between the two categories and cannot be broken down into components with a difference score. Blanton et al. (2007) continue to disagree with this argument and provide evidence that a two-factor structure explains more variance than a single attitude structure, concluding that these results demonstrate that IAT scores do not represent a relative preference measure (e.g., a unique attitude of “Black-White”), but rather a difference score between the two categories (e.g., difference between attitudes towards Whites and Blacks). This argument continues and has yet to be resolved. Further research may seek to demonstrate the relationship between several implicit measures comparing a single target category (e.g., Blacks) to many different target categories (e.g., White, Asian, Latino, etc.). Furthermore, additional methods have been developed that assess a single concept in isolation, not as a relative measure with a contrast category. These single concept measures are discussed further below.

In conclusion, although many criticisms of implicit measures have been fully or partially resolved, valid concerns still remain. No measure is perfect and without criticism. It is critical to the current study to understand the full scope of the validity evidence to inform decisions. Furthermore, implicit attitude researchers have called for additional research in order to provide a deeper understanding of these measures and to demonstrate further validity evidence (De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009).

**Single Concept Implicit Measures**

As discussed, one limitation of the traditional IAT is that it is a relative measure that assesses a concept in relation to a contrasting category (e.g., Republicans vs. Democrats; Flower vs. Insect; Black vs. White) rather than in isolation as a single concept. Thus, for concepts
without a natural contrast category (e.g., job satisfaction) or if a non-relative assessment of a concept is desired, the traditional IAT is not suitable. Recent research has developed implicit measures that do not require a contrast category. Several single-category (or non-relative) implicit measures have been proposed including the Go/No-Go Association Task (GNAT; Nosek & Banaji, 2001), the Extrinsic Affective Simon Task (EAST; De Houwer, 2003), and the identification-EAST (ID-EAST; De Houwer & De Bruycker, 2007a). In addition, the IAT has been modified in several ways to allow for single category assessment by representing the comparison category with a negated category (John-not John), blank, neutral, or non-words (e.g., Brendl et al., 2001; Kim, 2004; Rothermund & Wentura, 2004). However, each of these attempts to provide an implicit non-relative measure of a single category has various limitations and limited validity evidence, warranting their use to be discontinued in most cases. Variants of the traditional IAT have been developed which have been demonstrated to be more successful in measuring single concepts, specifically the Single-Target Implicit Association Test (Wigboldus et al., 2004) and the Single-Category-IAT (Karpinski & Steinman, 2006).

The Single-Target Implicit Association Test (ST-IAT; Wigboldus, et al., 2004) has recently gained research attention (e.g., Bluemke & Friese, 2007; Hofmann, Rauch & Gawronski, 2007; Richetin, Perugini, Adjali, & Hurling, 2007) and is not subject to the same limitations as the single category implicit measures listed above. The ST-IAT is a variant of the original IAT, but only provides one category to be measured. For example, an ST-IAT measuring implicit attitudes towards animals presents two attributes (good and bad) and the single category of animals. The first trials require the participant to sort positive and negative words into the categories of “good” and “bad”. The critical trials then add the category of “animal” to either the left or right keys, in addition to the attribute words. Therefore, the first
critical trial requires the participant to sort positive words, negative words, and animal names into the left category (e.g., “good or animal”) or the right category (“bad”). As in the IAT, the second critical trial of the ST-IAT switches the pairing of the category and attribute (“good” is assigned to the left; “bad and animal” is assigned to the right).

Karpinski and Steinman (2006) developed a procedure very similar to the ST-IAT entitled the Single-Category-IAT (SC-IAT). The main differences between the ST-IAT and the SC-IAT is that the SC-IAT requires a smaller response window (1500 to 2000 milliseconds maximum, as opposed to the 3000 milliseconds for the ST-IAT) and the calculation of the SC-IAT index incorporates responses to target and attribute stimuli, whereas the ST-IAT index is calculated solely on responses to the target stimuli. Furthermore, this new variant of the IAT, the ST-IAT, utilizes the updated IAT scoring algorithm which has been shown to resolve many of the previously existing issues with the IAT as discussed earlier. The ST-IAT measure was designed to successfully measure single-target concepts that do not have a natural contrasting category, such as job satisfaction.

In the current paper, a personalized version of a Single-Target IAT will be used to assess implicit job satisfaction. Although implicit measures have been used in organizational settings and constructs, the application has been limited; thus, there has been a call for additional research blending the domains of implicit measurement and organizations. This paper supports that directive by providing additional validity evidence in two relatively novel domains: implicit measures within the organizational context and a single-target measure.
Chapter 4: Personalization of Implicit Measures

Since the inception of the IAT, there have been various debates about theoretical and methodological aspects underlying the measure. As discussed earlier, the “person vs. culture” debate is one of the top three areas that have received the greatest attention (Greenwald & Nosek, 2009). This debate centers around the degree to which IAT scores represent an individual’s own attitude or the environmental influences. On one extreme, some authors suggest the IAT taps associations to which the person has been exposed to in his or her environment and that it does not capture the individual’s level of endorsement regarding the attitude object (e.g., Karpinski & Hilton, 2001). The response to this view is that cultural knowledge is ingrained through experience and becomes part of the association, which in turn influences the individual’s judgments and actions, regardless of conscious awareness or endorsement of these associations (e.g., Banaji, Nosek, & Greenwald, 2004). Moreover, a great deal of research has indicated that the IAT is more than just a pure measure of cultural knowledge (e.g., Nosek & Hansen, 2008a). Inspired by the potential influence of cultural knowledge on IAT scores, Olson and Fazio (2004) proposed a variant of the IAT in which the measure is “personalized” by making procedural modifications (e.g., changing the attribute labels from “Pleasant/Unpleasant” to “I like/I dislike” and removing error feedback, as it is not applicable to this approach) which enhanced correlations with explicit measures of the same construct. This measure recognizes the value in the IAT’s ability to assess implicit attitudes; however, it aims to remove the proposed contamination of “extrapersonal associations”, which is a broad category that encompasses cultural knowledge. Extrapersonal associations are defined as “information that is available in memory but that does not contribute to one’s attitudes toward a given object” (Olson, Fazio & Han, 2009, p. 152). For example, having knowledge of others’
attitudes towards chocolate or vanilla ice cream does not influence our own personal preference.

In the discussions surrounding the person vs. culture debate, it seems that the analysis is often an all or nothing issue, where the IAT provides a measure of cultural knowledge or it does not. The current manuscript proposes that the answer likely lies somewhere in between, with each of the differing perspectives providing an important contribution to fully understanding the complexities of implicit attitudes and their measurement. Thus, a personalized IAT was developed in this paper to assess job satisfaction, recognizing both the potential strengths and limitations of this method. Moreover, it is proposed that despite criticisms of the personalized IAT, it is valuable from a utility perspective, particularly within the domain of organizational research and organizations.

**Cultural Knowledge**

As discussed previously, one of the more captivating findings in implicit research is within socially-sensitive domains such as prejudice and stereotyping (e.g., Greenwald et al, 2009). Racial stereotyping research using the IAT has consistently demonstrated pervasive prejudice against Blacks in America (e.g., Lane, Banaji, Nosek & Greenwald, 2007; Nosek, Banaji & Greenwald, 2002). Given the discrepancy with explicit measures, which demonstrate much less prejudice, as well as the widespread nature of the implicit prejudice ratings that the IAT uncovered, these results are often quite surprising (Lane et al., 2007; Uhlmann, Poehlman, & Nosek, 2012).

In response to surprised reactions, researchers have reiterated that the key concept of the IAT is to assess associations, thus the prejudice findings are tapping into the negative Black stereotypes that are pervasive in American culture (Banaji, Nosek & Greenwald, 2004). Despite individuals’ lack of conscious awareness of these associations, these implicit attitudes can
contribute to subsequent behaviors. For example, McConnell and Liebold (2001) found that a racial attitude IAT predicted negative nonverbal behaviors, such as less smiling and more errors in speech, when interacting with a Black experimenter relative to a White experimenter. Similar findings have also been observed within the work domain as well. Green et al., (2007) found that doctors with stronger anti-Black attitudes on an implicit measure were less likely to offer desirable medical treatment to Black versus White patients with the same condition.

However, critics provide an alternate explanation for these surprising findings of widespread prejudice. They have suggested that these associations captured by the IAT should not be taken for attitudes; rather, they are reflections of cultural knowledge (e.g., Arkes & Tetlock, 2004; Fazio & Olson, 2003; Fiedler, Messner, & Bluemke, 2006). For example, individuals who do not personally enjoy drinking soda may demonstrate positive associations with Coca-Cola as a result of the knowledge of positive cultural attitudes towards Coca-Cola. Karpinski and Hilton (2001) identified this influence of cultural knowledge and proposed that it was a potential contaminating source of variance in the IAT scores. Given that prejudice is a socially sensitive topic, the dissociation between explicit and implicit results may be readily explained by individuals not being aware of or not wanting to admit their own prejudiced attitudes. Karpinski and Hilton examined attitudes that are not socially-sensitive and presumably should not demonstrate dissociation. However, they found a dissociation between IAT scores and explicit measures assessing preference for apples versus candy bars, with the implicit measure indicating an overwhelming preference for apples. Moreover, the explicit measure predicted behavior, whether a participant chose an apple or a candy bar, but the IAT did not. Karpinski and Hilton concluded that the IAT was contaminated with “environmental associations”, which are culturally shared but not necessarily individually accepted information.
(in this case, a positive association with apples and negative association with candy bars). Other authors have supported this idea of the contaminating influence of culture of the IAT (e.g., Arkes & Tetlock, 2004; Olson & Fazio, 2004). Olson and Fazio (2004) extended this concept further, to be discussed in more detail in the next section on extrapersonal associations.

Nosek and Hansen (2008a) conducted a large-scale study to further explore the potential impact of cultural knowledge on implicit attitude measures. They measured cultural knowledge by asking participants the same question about the two attitude objects of interest (e.g., African Americans and White Americans), “How warmly does the average person feel toward African Americans [White Americans]?”, and then taking the difference score between these items. A variety of self-reported measures were used to assess explicit attitudes, and a corresponding IAT was administered as well. Examining almost 100 different topics across more than 100,000 participants, they found an inconsistent and weak relationship between self-reported measures of perceived cultural attitudes and corresponding IAT measures. Moreover, they found that this small relationship was accounted for by explicit attitudes. In other words, cultural knowledge had little to no independent relationship with IAT effects, which they interpret to mean that cultural norms have been fully incorporated into individuals’ attitudes or that individuals are using their own attitude to estimate that of the culture. Nosek and Hansen conclude that cultural knowledge is not a contaminant of implicit attitude measurement. However, this conclusion rests on the relationships with a single item measure (“How warmly does the average person feel towards X?”). It seems that this question would be subjected to motivated distortion by participants as well, making the relationship with implicit measures lower as a result.

These two differing viewpoints take polarizing stands: cultural knowledge is an overwhelming contaminant of implicit attitude measurement or it is not. The current paper
proposes that the answer may be more complex than a simple “yes” or “no” conclusion. Implicit attitude measurement is a relatively new area of research and there are many unanswered questions and several theoretical issues that continue to be debated within the literature (Greenwald and Nosek, 2009). There are many benefits to a thorough exploration of a new measurement procedure. However, as noted by Nosek et al. (2011), the use of a single measurement procedure produces evidence and theory that is necessarily constrained by the idiosyncratic features of that procedure. Thus, there is value in using diverse measurement methods.

**Extrapersonal Associations**

Olson and Fazio (2004) introduced the concept of “extrapersonal associations” which are defined as information held in one’s memory, yet it does not impact his or her attitude toward a given object. The concept was inspired by Karpinski and Hilton’s (2001) line of thinking and the debate over the potential influence of cultural knowledge on implicit attitude measurement. However, a key difference from Karpinski and Hilton’s “environmental associations” is that the source of origin is irrelevant for extrapersonal associations. It does not require that the origin comes from a common place (such as cultural knowledge) or that the individual be aware of where it originated.

Olson et al. (2009) explain that their idea for extrapersonal associations stemmed from IAT findings that were in contrast with the results of priming measures of attitudes. For example, IAT studies have indicated that smokers have negative implicit attitudes towards smoking (Swanson et al., 2001) and that Blacks on average prefer Whites to Blacks on implicit measures (Nosek, Banaji & Greenwald, 2002). However, priming research has demonstrated opposite results: an automatic activation of positivity is observed in smokers to cigarettes
(Sherman, Presson, Chassin, Rose & Koch, 2003) and in Blacks to members of their own group (Fazio et al., 1995). Olson et al. (2009) do not propose that the IAT is an invalid tool. Rather, they acknowledge that the IAT does capture evaluative associations, but propose that in addition, it captures extrapersonal associations.

As discussed earlier, implicit attitudes are based on the fundamental idea of association. However, Olson and Fazio (2004) propose that when encountering an object, not every single association with the object is activated (Olson et al., 2009); instead, one’s idiosyncratic evaluation of the object is what becomes activated (Fazio, 1993). The question of what contributes to this evaluation is the core of attitude origin.

Olson et al. (2009) recognize the influence of cultural knowledge and examples of pure associative learning, which explains culturally pervasive attitudes such as American children’s near-universal liking for McDonald’s. However, they propose that not all learning experiences are equally weighted in one’s mind. When developing an explicit attitude towards an object, not all features of the object equally contribute to the development of that attitude. Similarly, not every exposure to an object equally contributes to the resulting implicit attitude. For example, an individual may dislike floral wallpaper, despite frequent exposure to it and knowledge that his or her mother likes it. Despite repeated exposure to the mother’s positivity towards floral wallpaper, the individual maintains a negative reaction to it, rendering the mother’s opinion irrelevant. Thus, the individual maintained an extrapersonal association: knowledge about someone else’s attitude towards an object, which did not affect his/her own attitude towards the object. A key point is that not every exposure to associative learning is equally weighted, creating some associations that are not attitudinally relevant. It is these extrapersonal associations that Olson and Fazio (2004) proposed were erroneously captured by the traditional
IAT. In order to parcel out the contaminating factor of this extrapersonal knowledge, they created a variant of the IAT: a personalized IAT, which is used in the current study.

**The Personalized IAT**

In their seminal work on extrapersonal associations, Olson and Fazio (2004) created a “personalized” IAT, which is a variant of the traditional IAT (Greenwald et al., 1998). The personalized IAT was developed in order to reduce the influence of extrapersonal information. The key modifications of the personalized measure are the attribute labels, which were changed from the standard “Pleasant” and “Unpleasant” to “I like” and “I don’t like”, and the removal of error feedback. When a participant makes an error in the traditional IAT, a red “X” is presented as error feedback, which is absent in the personalized version as there is no true “error” due to the measure assessing preference rather than operating as a sorting task. In accordance with their reasoning that the negative portrayal of African-Americans in the media makes negative extrapersonal associations of Blacks readily available, Olson and Fazio found that mean prejudice scores were more negative on the traditional IAT as compared to the personalized IAT. As a follow up to Karpinski and Hilton’s (2001) work, Olson and Fazio explored attitudes towards apples and candy bars, finding that the traditional IAT demonstrated strong positivity towards apples, as in previous research (e.g., Karpinski & Hilton, 2001), but the personalized IAT was more equivocal. Moreover, the personalized IAT predicted behavioral intentions of consumption of apples versus candy bars whereas the traditional IAT did not. Similarly, when exploring attitudes towards political candidates, the personalized IAT demonstrated stronger correlations with explicit attitudes, party affiliation and voting behavior than the traditional IAT.

Given that cultural knowledge may influence these objects of interest investigated (apples, candy bars, and political candidates), Olson and colleagues wanted to further distinguish
their concept of extrapersonal associations from the concept of cultural knowledge and
demonstrate how the source of the knowledge does not need to be normative or widespread.
Thus, Han, Olson, and Fazio (2006) conducted a study in which attitudes were created towards
novel objects in order to maintain experimental control over the extrapersonal associations. The
participants were provided information about two Pokemon characters, one of which was clearly
a “stronger” or preferred choice. After completing self-report evaluation measures to confirm
that participants had consolidated the information provided, participants were provided with
attitude-consistent or attitude-inconsistent extrapersonal association information in the form of a
videotape of a boy evaluating the same two characters. Next, participants completed subliminal
priming measures, the traditional IAT and the personalized IAT. Participants who viewed the
attitude-inconsistent information scored significantly lower on the traditional IAT, than those
who received attitude-consistent information, despite providing evaluations that this
extrapersonal information was foolish and irrational. However, the extrapersonal information
did not influence the self-report, subliminal priming or personalized IAT measures. Thus, the
extrapersonal information influenced implicit associations as measured by the traditional IAT,
even though this information was invalid. These results provide support for Olson and Fazio’s
(2004) view that not all information influences an attitude equally and the traditional IAT is less
adept at discriminating between different types of information than other implicit measures.
Therefore, the traditional IAT captures the unwanted variance of extrapersonal associations,
whereas the personalized IAT is better able to parse out that contaminating variance.

Given the relatively new notion of the personalized approach to measuring implicit
attitudes, the application of this method has been somewhat limited. However, the personalized
IAT has been found to reduce the impact of extrapersonal associations across several domains.
including racial prejudice, gender attitudes, and personal habits such as drinking and smoking. For example, smokers demonstrated negative associations with smoking on a traditional IAT but positive associations on a personalized IAT (De Houwer, Custers, & De Clercq, 2006). Houben and Wiers (2007) found that heavy drinkers demonstrated positive associations with alcohol on a personalized IAT, despite previous research in which negative associations with alcohol were demonstrated on the traditional IAT by heavy drinkers (Wiers, Van Woerden, Smulders, & De Jong, 2002). Research using the personalized IAT has also found it to be a better predictor of subsequent behaviors than the traditional IAT. For example, Hillard, Jackson, Riffle, and Schneider (2011) found that a personalized IAT, but not the traditional IAT, predicted egalitarian behavior toward women in science, such that participants with more positive personal associations between women and science donated more to an organization for women in science. Dambrun, Villate, and Richetin (2008) investigated attitudes of racial prejudice and found that both personalized and traditional IAT measures were significantly and positively related to explicit measures; however, when controlling for cultural-normative prejudice, the relationship between the implicit measure and personalized prejudice disappeared for the traditional IAT, whereas the relationship was still positive and significant for the personalized IAT. Thus, Dambrun et al. conclude that these results support the notion that the traditional IAT is contaminated by cultural and normative influences. Moreover, the personalized IAT was significantly related to a measure of relative deprivation, which is a robust determinant of racial prejudice, whereas the traditional IAT was not. Finally, additional research has also utilized the personalized IAT (e.g., Olson, Fazio, & Hermann, 2007; Vasey, Harbaugh, Buffington, Jones, & Fazio, 2012); however, the traditional IAT was not included, thus no direct comparisons between the two measures can be made.
Critiques of the Personalized IAT

The debate around the personalized IAT becomes somewhat muddied due to related but distinct concepts. The concept of extrapersonal associations was inspired by the debate on the influence of cultural knowledge on implicit measurement. However, extrapersonal associations are not synonymous with cultural knowledge, although some authors have presented evidence as if they were (e.g., Nosek & Hansen, 2008b); rather, cultural knowledge is just one example of an extrapersonal association. In the following, counterpoints will be presented to both the cultural knowledge and personalized IAT aspects of the debate.

The influence of culture on individuals, their attitudes, and associations is undeniable and it would be unreasonable to ignore the cultural context (e.g., Fiske, Kitayama, Markus, & Nisbett, 1998; Uhlmann, Poehlman, et al., 2012). However, the primary IAT researchers explain that the IAT expects these strong cultural influences (e.g., Banaji et al., 2004; Uhlmann, Poehlman, et al., 2012). In response to the initial claims that the traditional IAT was contaminated by influence of cultural knowledge (Karpinski & Hilton, 2001), IAT researchers responded that the associations captured by the traditional IAT may incorporate some cultural knowledge; however, this cultural knowledge is influential on attitudes and judgments (e.g., Banaji, Nosek, & Greenwald, 2004). These authors conclude that there is no “bright line” that clearly delineates culture and self; rather, implicit attitudes are seen as traces of experience within a culture and are so fully integrated into one’s own mind that it does not make sense to attempt to separate attitudes as “culture” versus “self” (Banaji et al., 2004). Thus, when attitudes are assessed, a cultural component may be captured, but this cultural influence affects and is incorporated into the attitudinal evaluation, as well as the resulting behaviors and judgments. As discussed earlier, Nosek and Hansen (2008a) conducted a large-scale study to investigate the
effects of cultural knowledge on the traditional IAT. They found that cultural knowledge was not strongly or consistently related to the IAT; furthermore, explicit attitudes accounted for the small relationships that were present. Thus, they conclude that cultural knowledge is fully incorporated into one’s attitude and attempting to parcel out these two influences is futile.

The two camps on either side of this debate also differ in their viewpoints on extrapersonal associations as well. A critical issue in this debate is the definition of personal versus extrapersonal associations, which Gawronski, Peters, and LeBel (2008) review and aptly note that these terms have not been sufficiently defined in the literature from a theoretical, methodological, or empirical perspective. They present several potential options of key criteria that would differentiate personal versus extrapersonal associations such as endorsement, representation, activation, functionality, and origin. Olson and Fazio (2004) admitted to conceptual fuzziness around the terms and attempted to provide additional clarity in the Olson et al. (2009) article by responding to each of the possible key criteria presented by Gawronski et al. Although Olson et al. do not specify exactly how personal versus extrapersonal associations are represented in one’s memory, they note that the “functionality” criteria comes closest to their conceptualization. Furthermore, they speculate that it may be some sort of “tagging” process, referencing cognitive models which propose tags or links to attitudinally-relevant information (e.g., Petty, Briñol, & DeMarree, 2007). Olson et al. tentatively suggest the possibility that source of information may be considered in the tagging process such that extrapersonal associations are flagged as not one’s own.

This criterion of functionality is a key theoretical difference between the two camps. Olson et al. (2009) suggested that although extrapersonal information may reside in one’s mind, it is not functional in the same way as one’s own attitudes, which contributes to approach and
avoidance decisions. Olson and Fazio (2004) do not suggest that one’s attitudes are uninfluenced by others or culture, or that the resulting influence can be entirely partialed out. However, it is reasonable that one’s attitude may deviate from the cultural norm, or from that of another individual, and it is that personal association that will be automatically activated and guide the individual’s behavior.

Nosek and colleagues disagree with this argument (e.g., Nosek & Hansen, 2008a; Uhlmann, Poehlman, et al., 2012) concluding that the potential tagging process requires deliberative processing and renders the outcome to be more conscious. They suggest that the implicit attitude system is “dumb” in that the associative process will encode a link between an attitude object and valence, regardless of the logical meaning of the relationship. Olson et al. (2009) directly state their difference of opinion: “Contrary to the view seemingly advocated by some (e.g., Nosek & Hansen, 2008[a]), we do not believe associative knowledge to be a collection of independent and unprioritized elements lacking for any integration and structure” (p. 21).

In addition to theoretical differences, these camps also disagree in the applied measurement techniques as well. In response to the personalized IAT developed by Olson and Fazio (2004), Nosek and Hansen (2008b) conducted another large-scale study to specifically examine the personalized IAT and compare it to the traditional IAT. In six studies with over 15,000 participants, Nosek and Hansen examined the procedural modifications of the personalized IAT and concluded that the stronger correlation found between the explicit measures and the personalized IAT versus the traditional IAT was due to unintended effects of these procedural modifications rather than reducing cultural knowledge. Based on their research they concluded: (a) participants are more likely to explicitly evaluate target concepts in the
personalized IAT rather than categorize them, thus not following the IAT task instructions, (b) this accounted for the increased relationship between the personalized IAT and self-reported attitudes, (c) personalizing the IAT does not alter the relationship with cultural knowledge, and (d) the traditional and personalized measures capture unique attitude variation. This study does not directly address the underlying conceptual issue of whether extrapersonal associations (including cultural knowledge) influence the IAT, and if this influence is construct-valid or a contaminant of the measure (Uhlmann, Poehlman, et al., 2012).

The key procedural adjustments made in the personalized IAT are to modify the attribute labels (from “Pleasant/Unpleasant” to “I like/I dislike”) and to remove error feedback, as it would be inappropriate to correct whether an individual likes or dislikes an object. Nosek and Hansen (2008b) suggest that removing the error feedback does not allow for any correction of responses as in the traditional IAT and the modification of the attribute labels encourages explicit evaluation of the object.

Another finding by Nosek and Hansen (2008b) was that the relationship between the IAT and cultural knowledge was not modified by personalizing. However, the initial relationship was very small, if at all present, according to the study, as well as in a previous study by the same authors (Nosek & Hansen, 2008a). Thus, there was not much of a relationship to change. Although Olson et al., (2009) do not directly respond to this study, their position on extrapersonal associations is that it is a broader concept than cultural knowledge. In both Nosek and Hansen studies (2008a, 2008b), cultural knowledge was measured in a similar way: a single item assessing what the respondent believes others’ attitude is toward the object of interest.

A potential limitation of this approach is that the method of assessing cultural knowledge is essentially the same throughout these studies (Nosek & Hansen, 2008a, 2008b). It is a single
item ad hoc measure to capture a rating of what the respondent believes others’ attitude toward
the object of interest is (e.g., “How warmly does the average person feel towards spiders?”).
This self-reported item is subject to the same limitations as all self-report items (e.g., social
desirability concerns, limits of conscious introspection); moreover, there are additional data
analysis limitations by relying on a single item measure.

Finally, Nosek and Hansen (2008b) found that the personalized and traditional IATs have
unique attitude variance. They regressed explicit attitudes on both of the implicit measures to
remove common variance and found that both implicit measures still were significant predictors
of explicit attitudes. Nosek and Hansen suggested that only the personalized measure should be
a significant predictor if it is just less contaminated by non-attitudinal associations. Olson et al.
(2009) do not suggest that the traditional IAT is an invaluable tool; rather, they propose that the
personalized version may be more relevant. The personalized IAT was more strongly
correlated with the explicit attitude measures in the study by Nosek and Hansen (2008b) as well as a variety
of other studies (e.g., Hillard et al., 2011; Olson & Fazio, 2004).

Summary and Application to the Organizational Domain

The topic of cultural influence on IAT scores has persisted in the literature for almost the
entire length of time that the IAT has existed because it is a critical issue in understanding what
exactly the IAT is capturing. Uhlmann, Poehlman, et al. (2012) note the relevance of the “person
or culture” question; specifically, it is particularly critical to legal and public policy decisions
and whether research on automatic associations should be applicable in these domains. Thus,
although the direction of this research may not be clear at this time, this topic has important
implications and is a worthwhile topic to continue to pursue.

Both sides of this debate have put forth compelling arguments. There is disagreement on
much of the interpretation of the data, in some cases having two opposite conclusions from a single source of data. Data can be interpreted to support opposing theoretical positions and despite the fact that a conclusion may not be easily reached empirically, it does not render useless the surrounding theoretical discussion. Moreover, both sides of the debate (Nosek and colleagues as well as Olson, Fazio, and colleagues) do agree on the potential benefit of a personalized measure, and that pursuing it is worthy and an interesting cause. Uhlmann, Poehlman, et al. (2012) conclude, “Despite some of the caveats discussed above, the notion of personalizing implicit measurement is innovative and appealing, and there are potentially meaningful differences in personalized versus general evaluative associations” (p. 248).

Payne and Gawronski (2010) note that this extrapersonal association debate is part of a larger debate of the notorious tension between person-based and situation-based approaches. They suggest learning from the struggles of this debate within personality and social psychology research by examining person by situation interactions. Thus, they suggest that the resolution to this debate may lie somewhere in between both sides of the argument. The current paper proposes the view that the issues in the current debate of extrapersonal associations are complex and need much further research to understand the underlying mechanisms. Although the current personalized IAT measure is not perfect and has been subject to criticism, it is still worthy of additional exploration until a new, improved method of measurement is proposed.

Furthermore, using the current personalized measure may be particularly beneficial within the organizational realm from a utilitarian perspective. Although it may be ideal to use measures whose theoretical bases have been fully explored and agreed upon, that is often not the case in practice (e.g., intelligence has no agreed upon definition; Niesser et al., 1996). In fact, the traditional IAT has been used in thousands of studies over the last decade and a half despite
ongoing debates about core theoretical issues (e.g., Greenwald & Nosek, 2009). For example, the traditional IAT has been found to predict outcome measures (e.g., Greenwald et al., 2009) and there is initial validity evidence provided for the personalized IAT (e.g., Han et al., 2006; Hillard et al., 2011). Although the currently proposed personalized IAT may have limitations, it can provide potentially unique and useful data, and a superior alternative is not currently available. Furthermore, the utility of this measure may be of particular importance within the work domain for several reasons.

Firstly, employers may be more likely to be focused on the practical utility of a measure rather than the details of the theoretical argument, as long as a basic theoretical foundation is established. Secondly, personalized implicit measurement may have some particular advantages as a method to assess attitudes within the workplace, particularly for single-target objects. The use of this method may improve upon the explicit measures that are the norm in this context. Moreover, organizationally-relevant attitudes such as job satisfaction are particularly complex and personal, making them well-suited for both an implicit and personalized measure. Attitudes within the work domain are complex and are related to behaviors that are both deliberative and automatic (e.g., Leavitt et al., 2011). For example, Scherbaum and Meade (2013) note that decisions such as leaving a position or implementing a strategy require contemplation and have multiple determinants. A criticism of the personalized IAT measure is that it may encourage more deliberative processing than the traditional IAT; however, in the case of organizationally-relevant attitudes such as job satisfaction, this may be suitable. Moreover, an attitude such as job satisfaction is particularly personal and is less likely to be shared widely by others, such as attitudes investigated in the wider cultural knowledge debate; therefore, the personalized IAT may be especially appropriate for measuring attitudes in the organizational domain. Thirdly, the
implicit-explicit correlations for organizationally-relevant attitudes tend to be in the lower range of observed correlations, thus exploring alternative methods to enhance these correlations may be advantageous. In recent large scale studies (Nosek, 2005; Nosek & Hansen, 2008a), the range of correlations between implicit and explicit measures has been weak (e.g., Future vs. Past, \( r = .14 \)) to strongly positive (e.g., pro-choice vs. pro-life, \( r = .62 \)), with an average corrected correlation of \( r = .48 \) (\( r = .36 \) uncorrected) across all topics in both studies (Nosek et al., 2012). Studies of implicit job satisfaction have been within the lower end of that range, \( r = .15, .16 \) (e.g., Boyd, 2010), and \( r = .28 \) (Siers & Peters, 2011). Finally, the impact of explaining additional variance in outcome measures, even if very small, can have a large impact. For example, reducing unwanted attrition by less than one percent could potentially save a company millions of dollars. Thus, increasing the explanatory power of a measure, by using a personalized versus traditional implicit measure, could potentially have a substantial impact for organizations.

In conclusion, although the personalized IAT may be subject to criticism, it can provide meaningful data that may be particularly appealing and useful to organizations. From this utilitarian perspective, the personalized IAT may be beneficial despite the ongoing theoretical debates.
Chapter 5: Job Satisfaction

Recent research has called for an increase in the application of implicit measures in organizations (Becker & Cropanzano, 2010; Scherbaum & Meade, 2013; Uhlmann, Leavitt et al., 2012) given their success in prediction across a variety of other domains (e.g., Greenwald et al., 2009). The current paper supports this appeal by examining a personalized implicit measure of job satisfaction. However, before moving onto a discussion of assessing job satisfaction implicitly, a discussion of explicit job satisfaction is warranted.

The Construct of Job Satisfaction

Job satisfaction is among the most researched variables in the organizational sciences over the last 70 years (Brief & Weiss, 2002); in fact, it is noted as “the primary attitude investigated by organizational scientists” (Brief, 1998, p. 1, emphasis in original). One of the reasons for the interest in job satisfaction is its presumed relationship with other organizationally-relevant attitudes and behaviors, particularly job performance (Fisher, 2003). The core of this assumption rests on the theoretical influence of attitudes on behavior in Fishbein and Ajzen’s (1975) theory of reasoned action, which also contributes to the “a happy worker is a productive worker” theory (Spector, 1997). The job satisfaction-job performance relationship has garnered such a considerable amount of research that it has warranted three meta-analyses (i.e., Iaffaldano & Muchinsky, 1985; Judge, Thoresen, Bono, & Patton, 2001; Petty, McGee, & Cavender, 1984), as well as gained the title of the “holy grail” of industrial psychology (Landy, 1976). Despite the theoretical connections and vast amount of research, the satisfaction-performance relationship has been shown to be moderate at best, with meta-analytic correlations ranging from .15 (Iaffaldano & Muchinsky, 1985) to .30 (Judge et al., 2001). The empirical relationship between job satisfaction and other organizationally-relevant attitudes and behaviors
has been similarly moderate or inconsistent as compared to the theoretical relationships (e.g., organizational commitment; Mathieu & Zajac, 1990; Tett & Meyer, 1993). Although in some cases the proposed strength of the theoretical relationships may be unrealistic given the multidimensional nature of organizationally-relevant criteria, it is still beneficial to explore potential reasons for these moderate relationships to enhance our understanding of this important construct of job satisfaction.

Boyd (2010) reviews several potential reasons for the moderate and inconsistent relationships between job satisfaction and other organizationally-relevant attitudes and behaviors, noting that each of these is rooted in some form of measurement issue. One possible reason may be that the criterion is complex and job satisfaction may only be related to a limited portion of it; thus, it may not be expected that the two variables correlate highly. For example, the criterion of job performance is influenced by many factors other than satisfaction including ability, motivation, environmental constraints, and competing attitudes (Fisher, 1980). Another potential rationale is the need to expand the criterion. For example, Organ (1988) suggests that the satisfaction-performance relationship can be strengthened through expanding the traditional domain of performance beyond task performance to include organizational citizenship behaviors (OCBs). By including OCBs, which are voluntary extra-role activities that contribute to organizational effectiveness, a stronger relationship between job satisfaction and job performance may be observed (Organ, 1988). A final potential explanation may be the presence of a variety of contextual moderators (Judge et al., 2001). Previous research has examined several moderators of the satisfaction-performance relationship including job complexity (Ivancevich, 1978, 1979), situational influences (Baird, 1976; Cherrington, Reitz, & Scott, 1971; Podsakoff & Williams, 1986), and personality variables (Jacobs & Solomon, 1977; Kaldenberg,
& Becker, 1991). Therefore, there are a variety of potential measurement issues in assessing job satisfaction. Historically, job satisfaction has been measured with the same method: self-report. As a result, it becomes difficult to assess the influence of method of measurement from the measurement of the construct itself. Below is a review of attempts at alternative methods of measuring job satisfaction.

Self-Report Measures of Job Satisfaction and Their Limitations

Given the popularity of job satisfaction over the last several decades, many measures have been developed which assess different aspects of the construct; however, the method of measurement has been constant. The dominance of the self-report method is apparent across measurement of most organizationally-relevant attitudes (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The overwhelming use of this method organizational research is warranted given the many strengths of this method, including the ease of administration and scoring, accessibility of existing scales, and low cost. However, self-report measures are subject to a variety of limitations which may be particularly relevant in the domain of job satisfaction, including: characteristics of the measurement tool (e.g., item wording or response options; Schwarz, 1999); the limitations of conscious processing (Nisbett & Wilson, 1977); and self-presentational biases such as socially-desirable responding (Paulhus, 1991) or demand characteristics (Orne, 1962), as discussed below.

First, self-report measures are subject to the influence of features of the measurement tool itself (Schwarz, 1999). For example, the same 10-point response scale can produce very different responses depending on whether the starting point is a negative number (-5 to 5) or zero (0 to 10). Similarly, items presented adjacently can influence responses by activating a concept in one’s mind, similar to spreading activation as discussed earlier. Schwarz
recommends that these factors are considered and their influence understood when interpreting results. One of the strengths of self-reported job satisfaction measures is that they have been used frequently in research over the last several decades and well-tested, thus presumably some of these influences have been attenuated. However, the influence of all the features of self-report measures in job satisfaction cannot be fully estimated, thus may potentially be a limitation in organizational research.

Another limitation is the constraints of conscious introspection, as reviewed earlier. This limitation is applicable to job satisfaction, as many evaluations operate outside of conscious awareness and yet, still impact perceptions and behavior unbeknownst to the individual (e.g., Bargh & Chartrand, 1999; Fazio, Jackson, Dunton, & Williams, 1995). However, often only the consciously processed self-report portion of the attitude is captured by the self-report measure, potentially impacting and attenuating the observed relationships with other variables. Research has indicated that the reported levels of job satisfaction across many samples over many decades tend to be relatively high. Several decades ago, in a review of 191 studies examining job satisfaction, only 18% of all employees in the studies could be classified as dissatisfied (Robinson & Hoppock, 1952). Similarly, recent surveys found that 87.5% (Mendes, 2011) and 81% (Society for Human Resource Management, 2012) of surveyed adults reported overall satisfaction with their job. This positive trend in reports of job satisfaction has many potential explanations, one of which is cognitive dissonance. By providing a lower rating, indicating dissatisfaction, an employee would be demeaning the job he or she is currently working in, and thus questioning his or her own competence (Blauner, 1964). Therefore, in order to avoid cognitive dissonance an employee may need to believe that he or she likes his or her job, even if there are negative aspects. However, research has demonstrated that the process of cognitive
dissonance reduction is relatively automatic and does not require conscious control or explicit memory (Lieberman, Ochsner, Gilbert, & Schacter, 2001), thus the employee may not be aware of the attitude change process. Moreover, cognitive dissonance has been found to alter conscious, explicit attitudes but not nonconscious, implicit attitudes (Gawronski & Strack, 2004). Consequently, it is possible that although the reported levels of the attitude of job satisfaction are high, the nonconscious attitudes towards the job may be lower and still influential on subsequent perceptions and behavior. A potential deficiency in measurement may occur by only measuring the self-reported portion of the attitude, limiting the strength of observed relationships with other constructs.

A final potential limitation of self-report measures is the accuracy of the attitude presented by the respondent. For example, socially desirable responding may influence job satisfaction ratings through self-deception or impression management (Paulhus, 1991; Zerbe & Paulhus, 1987), where the respondent may present an inflated level of satisfaction to make himself or herself feel better, or to appear more satisfied to others. Parker (1967) suggested a potential reason to present inflated job satisfaction levels could be to avoid an admission of failure to oneself or others. Evaluation apprehension (Rosenberg, 1969) and demand characteristics (Orne, 1962) could potentially influence the assessment of job satisfaction as well. For example, if the survey is administered by the employer, the respondent may feel the need to provide inflated job satisfaction ratings to be viewed positively or to avoid potential perceived retribution from the organization. This effect could be attenuated if the survey was anonymous or if it was conducted by a source external to the organization. Given the plausibility of all of these potential influences on the measurement of job satisfaction using self-report tools, coupled with the almost exclusive use of these measures historically, it is difficult to disentangle the
effects of the measurement tool from the actual assessment of the construct. In light of the indispensable information obtained via self-report tools, this paper proposes to explore alternative complementary methods that may have superior criterion-related validity.

**Alternative Measures of Job Satisfaction**

Researchers have attempted to explore alternative sources for assessing job satisfaction as a result of these potential limitations of the self-report method, although none have proven to be highly successful (Spector, 1997). The main focus of alternate approaches has been a source other than the individual providing an estimate of the level of job satisfaction. For example, Spector, Dwyer, and Jex (1988) had supervisors provide estimates of their employee's level of satisfaction. Glick, Jenkins, and Gupta (1986) trained observers to monitor an employee and attempt to approximate the employee’s job satisfaction. In both cases, the correlation between the rater’s and the employee’s level of satisfaction was only moderate. Ratings provided by family members, who presumably know the person of interest intimately, have also been explored. Husbands provided estimates of their wife's level of satisfaction as working mothers (Barling & MacEwen, 1988) and elementary school children provided estimates of their parents’ level of satisfaction (Trice & Tillapaugh, 1991). In these studies, the criterion has been agreement with the self-reported level of job satisfaction, rather than with organizationally-relevant outcomes. Given there was only moderate agreement between the self-report of the individual and the outside source, these attempts were not successful enough to warrant further application of this method (Spector, 1997).

In summary, although a great deal of value is provided by explicit job satisfaction measures, they are not without limitations. Thus, alternative measures will be explored as a complement to these existing methods.
Chapter 6: Implicit Measurement of Job Satisfaction

Given the widespread use of implicit measures and their predictive ability within the social psychological domain (e.g., Greenwald et al., 2009), they have been applied to a variety of other domains since, including the organizational sciences. For example, implicit measures of prejudice have been found to impact hiring decisions (e.g., Agerström & Rooth, 2011; Derous, Nguyen, & Ryan, 2009; Rooth, 2010; Yogeeswaran & Dasgupta, 2010). Derous et al. (2009) found that job suitability ratings were influenced by implicit anti-Arab bias, but not explicit bias. However, the application of implicit measures in the organizational sciences has been somewhat limited despite the potential great benefits (Uhlmann, Leavitt, et al., 2012). Accordingly, there has been a recent call for additional research in this domain utilizing implicit tools (Becker & Cropanzano, 2010; Scherbaum & Meade, 2013). Organizational behavior research has historically focused on how explicit attitudes impact work-related outcomes, sometimes with disappointing results (Becker et al., 2011). Becker et al. suggest that incorporating implicit measurement into organizational research and practices is important and may help to shed additional light on these relationships.

It is important for researchers to understand situations in which implicit measures are valuable and relevant, rather than attempt to generically apply them to all organizational constructs and outcomes. Several recent articles provide reviews and guidance on the use of various implicit measures within the organizational domain (e.g., Haines & Sumner, 2013; Uhlmann, Leavitt, et al., 2012). For example, implicit measures are most predictive of automatic behaviors, particularly in ambiguous situations (Becker et al, 2011; Greenwald et al., 2009). Although many work decisions may be deliberative and have well-defined criteria, such as designing and implementing a new strategy or product, these decisions have multiple
determinants (Scherbaum & Meade, 2013) and may include aspects more relevant to implicit measurement. Attitudes and behaviors within the work domain are complex and have components that are both deliberative and automatic (Leavitt et al., 2011). For example, explicit measures may be more relevant when examining the relationship between job satisfaction and a deliberative behavior such as deciding to leave one’s job, but implicit measures may be relevant when examining less deliberative behaviors such as social interaction with coworkers. However, implicit attitudes have been shown to have an impact on deliberative behaviors as well. Von Hippel, Brener, and von Hippel (2008) found in a sample of nurses that implicit negative prejudices about drug users mediated the relationship between stress and intentions to quit, above and beyond explicit measures of prejudice and satisfaction. Furthermore, Becker et al. (2011) suggest that not considering implicit attitudes in some cases can have negative effects for management. For example, one of the reasons organizational change efforts may fail is due to managers not considering the effect of implicit attitudes, solely focusing on explicit attitudes, and as a result overestimating employees’ ability to adapt to change. However, to date, the application of implicit measures has been somewhat limited within the organizational domain and needs to be further explored in order to be widely applicable and utilized by organizations as a valuable tool. Moreover, as recommended by several authors, it is essential to consider the construct of interest and understand how implicit measures are relevant (e.g., Scherbaum & Meade, 2013). Accordingly, a review of implicit research and theory relevant to implicit job satisfaction follows.

Relevance of Implicit Measurement in Job Satisfaction

As discussed earlier, the sustained interest in the relationship between job satisfaction and behavior at work, specifically job performance, has driven many decades of research on the topic
with weaker results than often anticipated (e.g., Judge et al., 2001). The relatively novel use of implicit measures in organizational settings may be able to shed additional light on the construct of job satisfaction. An essential initial consideration is whether implicit methodology is appropriate for job satisfaction as a construct.

Research has demonstrated a great deal of support for implicit measures predictive ability of nonconscious behaviors such as body language and friendliness in social settings (McConnell & Leibold, 2001), amount of eye contact and blinking (Dovidio et al., 1997), and level of anxiety as rated by others (Egloff & Schmukle, 2002). Moreover, implicit measures are also successful in predicting consciously controlled behaviors when the individual is unaware that the behavior is being measured or relevant to the research (e.g., McConnell & Leibold, 2001). For example, McConnell and Leibold found that an implicit measure of racial prejudice was more strongly related to level of friendliness in an interaction with a Black experimenter than the explicit measure. Although these behaviors were consciously accessible and controlled by the participants (smiling, amount of speech, and speech errors), the participants were unaware of the measurement and relevance of these measures. Similarly, implicit job satisfaction may be able to make a contribution to the prediction of conscious behaviors when the employee is not aware that the behavior is being assessed by the manager. For example, an employee may take frequent work breaks, not realizing that his or her boss is taking note of the time absent.

Given the success of implicit measures in social settings, and the fact that work occurs in a social context, implicit measures may be particularly applicable. Both conscious and nonconscious social behaviors influence the work domain and the various work behaviors that take place there such as performance, organizational citizenship behaviors, counterproductive work behaviors, performance evaluations, peer interaction, and teamwork. Research supports
the influence of social or interpersonal influences on work-related behaviors such as participating in performance appraisals (e.g., Borman, White, & Dorsey, 1995; Levy & Williams, 2004). For example, Grey and Kipnis (1976) found that the presence of a non-compliant employee influenced the performance ratings of other employees, as a function of a contrast effect. Similarly, Mitchell and Liden (1982) demonstrated that a manager’s perception of an employee’s social skills influenced performance ratings, where poor performing employees were rated more positively than good performers if the employee was perceived to have high social or leadership skills. In the 1990’s, there was a marked increase in research which found support for and emphasized the social context of performance appraisals (Levy & Williams, 2004). For example, rater affect (e.g., Lefkowitz, 2000) and personality (e.g., Bates, 2002) have been found to influence performance appraisal ratings in many studies. Therefore, the work setting clearly has a social context and this context influences other work-related behaviors such as performance ratings (Murphy & Cleveland, 1995). Implicit measures of job satisfaction may be able to explain a unique portion of variance in these social behaviors. Thus, the social context of work and the presence and influence of a variety of nonconscious stimuli create a setting in which implicit measures of job satisfaction may be related to other work-related variables in a way that explicit measures are not. However, this paper proposes to use implicit measures as a complement to existing explicit measures to allow for greater understanding of the construct of job satisfaction and its relationship with a variety of organizationally-relevant behaviors. Within the last few years, several studies have begun to investigate implicit job satisfaction and relationships with varied outcome measures.

**Implicit Job Satisfaction**

One of the initial attempts at measuring job satisfaction implicitly was conducted by
Sumner and Haines (2004). They used a variation of the IAT which allowed participants to enter terms for the categories of “my job” and “not my job”. The participants were then presented with these items and required to pair the items with the evaluative categories “pleasant” and “unpleasant”. Presumably, the final averaged response latency represents the degree to which the individuals are satisfied with their job as compared to things not within the realm of their job.

The implicit measure of job satisfaction was found to be significantly yet moderately correlated with the short form of the MSQ (Weiss et al., 1967) and more strongly correlated with the Work subscale of the JDI (Smith et al., 1969), but not correlated with other subscales of the JDI; thus, providing both convergent and discriminant validity evidence. A limitation of this study is that since participants selected items that did or did not represent the individual’s job, the findings can only be interpreted within that framework. The participant’s level of job satisfaction is contingent upon the comparison category, which are the terms they supplied for “not my job”. The choice of terms for each category could vary greatly providing different comparisons for each individual, as well as the degree of personal valence. For example, if a lawyer chose items for “not my job” representing custodial work (e.g., cleaning, sweeping, washing) or accounting (e.g., bookkeeping, calculating), both of these categories may equally represent “not my job”. However, if the lawyer had an extreme dislike for custodial work but did not have a strong feeling towards accounting, the choice of the terms for the contrast category “not my job” may have a confounding effect. The individual may appear to be much more satisfied with being a lawyer in comparison to being a custodial worker, if the lawyer has an extreme dislike for custodial work; whereas, the magnitude of satisfaction may be smaller when compared to a profession that the lawyer does not have negative feelings towards, such as accounting. Due to the process of participants controlling the valence of the categories, the possibility of this
confound cannot be ruled out.

As previously noted, the assessment of an attitude only in relation to a contrast category is a well-known limitation of the IAT (Nosek & Sriram, 2007). Job satisfaction is an attitude that does not have a natural contrast category. Initially proposed by Herzberg (1968), the concept of job satisfaction and job dissatisfaction existing on two different continuums has not however been supported by research (Locke & Henne, 1986; Pinder, 1998). Most current measures conceptualize job satisfaction on a single continuum (e.g., JDI, JDS, and MSQ). Attempting to modify the traditional IAT to measure job satisfaction, without a natural contrast category, has proven to be difficult (e.g., Kim, 2004; Sumner & Haines, 2004). Since these initial attempts, additional implicit measurement methodology has been created to accommodate single-concept constructs.

Boyd (2010) utilized one these measures, the Single Target IAT (ST-IAT), to create a new method of assessing implicit job satisfaction. This new measure was examined in relation to a variety of self-report measures including explicit job satisfaction and other organizationally-relevant attitudes and behaviors. Boyd found small but significant correlations with explicit measures of job satisfaction, \( r = .15 \), MSQ (Weiss et al., 1967) and \( r = .16 \), OJS (Brayfield & Rothe, 1951), providing initial construct validity evidence. Although it was not anticipated that these relationships would be of a great magnitude, they are at the low range of average implicit-explicit correlations across various areas of research (Nosek et al., 2012). The implicit measure of job satisfaction was also related to explicit measures of job involvement, affective commitment, frequency of lateness, and turnover intention, discussed further in later chapters of this paper. However, it was not found to be related to measures of organizational citizenship behaviors (OCBs), counterproductive work behaviors (CWBs) or the other measures of lateness
and absence. Furthermore, the implicit measure did not explain additional variance in OCB, CWB, absence, and turnover intentions, but did for frequency of lateness although the explained variance was quite small. Again, the details are further discussed in later chapters.

Siers and Peters (2011) used similar method, the Single Category IAT (SC-IAT), to assess implicit job satisfaction. They found implicit job satisfaction was significantly related to the explicit measures of job satisfaction ($r = .28$; Job Satisfaction Survey; Spector, 1997) as well as to behaviors such as withdrawal and absenteeism. There are several differences in the methodology between the Siers and Peters’ study and the current study. Siers and Peters used the SC-IAT, which differs from the ST-IAT used by Boyd (2010), and the modified version that will be used in the current study. The SC-IAT has a shorter response latency window than the ST-IAT and incorporates responses to the attributes, in addition to the target stimuli. The stimuli (descriptors) for the attributes were different between the studies, as well as the explicit job satisfaction measures. The correlation between implicit and explicit job satisfaction was $r = .15$ and $r = .16$ in Boyd versus $r = .28$ in Siers and Peters. Thus, the current study will incorporate the explicit job satisfaction measure used by Siers and Peters, as well as the same positively and negatively valenced stimuli, for comparison and to examine whether resulting correlations may be enhanced with an alternate measure. However, the current study will continue to use the ST-IAT as it uses the updated IAT scoring algorithm discussed earlier in this paper that has been shown to resolve many of the prior criticisms.

Different facets of work satisfaction have also been explored with implicit methodology. Leavitt et al. (2011) found that a combination of explicit and implicit work attitudes (e.g., coworker and supervisor satisfaction) predicted performance and citizenship behavior better than either the implicit or explicit measures alone.
In light of this research, it is reasonable that the attitude of job satisfaction, and its relationships with organizationally-relevant attitudes and behaviors, may be more fully understood by using both implicit and explicit measures. However, although the correlations between implicit and explicit job satisfaction in Boyd (2010), Siers and Peters (2011), and Leavitt et al. (2011) are within the range of implicit-explicit correlations in large scale studies (e.g., Nosek et al., 2012), they are at the lower end of that range. Boyd (2010) provided potential explanations for these low correlations, including that the implicit measure may have been assessing respondents’ attitudes towards work in general, due to the nature of the stimuli and the measure, whereas the explicit measure may have been more specifically capturing their attitudes towards their own work. The current paper proposes that personalizing the single-target implicit measure may better capture respondents’ attitude towards their own work; thus, enhancing the correlations with explicit measures of organizationally-relevant attitudes and behaviors, furthering our understanding of the construct of job satisfaction.

Given that this personalized measure is a newly proposed measure of job satisfaction, this study seeks to provide initial construct validity evidence for this measure by conducting a full multi-trait multi-method (MTMM) study. Additionally, this paper will also examine criterion-related validity evidence for this new measure. In order to address both of these goals, two separate studies will be conducted to examine all of the hypotheses. Study 1 will examine the first set of hypotheses (H1-H2), providing initial construct validity evidence for the new personalized implicit job satisfaction measure. Study 2 will examine the subsequent hypotheses, focusing on criterion-related validity evidence, as well as providing additional construct validity evidence.

Study 1 will utilize the MTMM perspective (Campbell & Fiske, 1959), which specifies
that implicit and explicit measures of the same construct should be both related and distinct, and should demonstrate a stronger relationship with each other than measures of different constructs using the same methodology (e.g., two explicit measures of theoretically unrelated constructs). As a result, this method provides convergent and discriminant validity evidence. Job satisfaction, the construct of interest, will be examined through implicit and explicit measures. The unrelated construct that will be used is attitudes towards the Christian religion, which will be measured with implicit and explicit measures. This measure was selected for the sake of comparability to the original ST-IAT paper, as this was the measure used by Wigboldus et al. (2004). There is no apparent, substantial theoretical overlap between the constructs of job satisfaction and Christianity.

Confirmatory factor analysis (CFA) has been adapted to the analysis MTMM matrices (Widaman, 1985) and applied within IAT research as well (e.g., Cunningham et al., 2001; Nosek & Smyth, 2007). CFA allows for analysis of the latent structure of the constructs underlying the data, a measure of the variance attributable to trait and method factors, and direct testing of hypotheses rather than inferring it from the patterns of correlations which is the historical method of analyzing MMTM matrices.

The current study examines two constructs (job satisfaction and attitudes toward Christianity) by measured by two methods (implicit and explicit). It is anticipated that discriminant validity will be demonstrated between the two constructs, where job satisfaction and attitudes toward Christianity will be unrelated factors. Within construct and between measures (i.e., explicit job satisfaction and implicit job satisfaction or explicit attitudes toward Christianity and implicit attitudes toward Christianity), as demonstrated previous IAT research (e.g., Boyd, 2010; Nosek & Smyth, 2007) it is anticipated that both convergent and discriminant
validity will be demonstrated such that the factors are related but distinct. Various models will be tested that provide two method factors account for the observed variance between measures, within construct. Thus, when examining all four types of measures together, it is anticipated that each would load onto its own latent factor, yielding four latent factors total: implicit job satisfaction, explicit job satisfaction, implicit Christianity, and explicit Christianity (see Figures 1-4 for models tested; Model 3 is anticipated to provide best model fit). Given there are three separate measures of explicit job satisfaction, each measure will be examined independently in the model testing. The analyses will be replicated another two times for each of the remaining explicit job satisfaction measures. In line with a traditional MTMM framework, monotrait monomethod measures (e.g., the three explicit measures of job satisfaction) are expected to all load on the same factor. Furthermore, as indicated in prior IAT research, it is anticipated that the implicit and explicit constructs will be related but distinct (e.g., Cunningham et al., 2009; Greenwald & Nosek, 2009). Therefore:

**H1:** A four factor model will be the best fit for the data (in which the implicit and explicit constructs are related but distinct) when examining all measures together, as compared to the other tested models.

However, another benefit of using CFA is to test various hypotheses directly and individually, examining only some of the measures in the study. It is anticipated that if the two implicit job satisfaction measures (personalized and non-personalized) are examined along with the other variables (e.g., explicit and implicit attitudes toward Christianity), they will form a single latent factor due to the variance from the other measures, thus resulting in four latent factors. However, if examining the implicit job satisfaction measures alone, it is anticipated that the two implicit measures will each form its own single factor, indicating a two factor model.
The theoretical rationale is that the implicit measures are different enough to load onto their own factors when examined directly; however, when examined amongst the rest of the measures in the study, they are similar enough to load together onto a single latent factor.

**H2:** When examining only the two implicit measures of job satisfaction (personalized and non-personalized), a two factor model will provide the best fit as compared to a single factor model.

The contribution of this paper is to examine a new personalized implicit measure of job satisfaction, providing construct validity evidence for this measure, and exploring relationships with existing job satisfaction measures. Combining single-target implicit measures with the personalized approach is novel within the domain of work, thus an additional contribution of this paper. Relationships between this new personalized measure and other organizationally-relevant attitudes and behaviors, will be explored in later sections (within Study 2) to provide additional preliminary criterion-related validity evidence for the personalized IAT measure.
Chapter 7: Relationships between Job Satisfaction and Organizationally-Relevant Attitudes

There is an abundance of job satisfaction research (Judge et al., 2001). Many studies have examined the relationship between job satisfaction and other work-related attitudes such as organizational commitment and job involvement. This study will examine job satisfaction in relation to both of these constructs as well.

Organizational Commitment

Several definitions of organizational commitment have been proposed over time; however, much of recent research has relied on an understanding of the term which generally refers to an employee’s relationship with an organization and the sense of attachment or allegiance the employee has towards the organization (e.g., Meyer & Allen, 1997). The conceptual similarities between job satisfaction and organizational commitment have been acknowledged by several researchers (e.g., Harrison, Newman, & Roth, 2006; Hulin, 1991). Research has also reflected the relationship between these variables. Meta-analytic mean corrected correlations of $r = .53$ between overall job satisfaction and organizational commitment (Mathieu & Zajac, 1990) indicate the positive relationship between these variables.

Initially the attitude of organizational commitment was conceptualized as a global or single-component variable but research in the 1990s proposed a three-component approach (Allen & Meyer, 1990). The three suggested components are affective (the emotional or affective attachment to an organization), continuance (the perceived costs versus the benefits of leaving an organization), and normative commitment (the personal values of the employee, including a sense of obligation to stay with the organization; Allen & Meyer, 1990). Based on meta-analyses, of the three components of organizational commitment, affective commitment
has the strongest relationship with overall job satisfaction. Meyer et al. (2002) found a mean corrected correlation of $\rho = .65, .31, \text{ and } -.07$ between overall job satisfaction and affective, normative, and continuance commitment, respectively. Moreover, the correlation between affective commitment and overall job satisfaction was larger than the correlations between any of the three components of organizational commitment. Similarly, Mathieu and Zajac (1990) found a mean corrected correlation of $r = .69$ between overall job satisfaction and attitudinal commitment. Attitudinal commitment is conceptually similar to the affective commitment component of Allen and Meyer’s (1990) conceptualization of organizational commitment. Harrison et al. (2006) suggest combining affective commitment and job satisfaction under the larger concept of overall job attitude, due to their conceptual similarities noting that “each is a fundamental evaluation of one’s job experiences” (p. 306, emphasis in original).

Recent research has proposed another adaptation in the evolution of the conceptualization of commitment. A new model and definition of commitment put forth by Klein, Molloy, and Brinsfield (2012) defines commitment as “a volitional psychological bond reflecting dedication to and responsibility for a particular target”. The bond is volitional, in that it is at the will of the employee in question, not a necessary requirement of the employment arrangement or a default. Other bonds may be more relevant and supersede the need for organizational commitment. For example, a contract employee may rely on an instrumental bond rather than a commitment bond to the organization, which makes the latter unnecessary or unwanted. Furthermore, the newly proposed definition is unidimensional. Although the essence of the Meyer and Allen (1997) model is a single dimension, that is obtained through choosing one of or combining the three components of commitment in the model. Instead, these features are considered as antecedents in the new model, which influence cognitive and affective processes that in turn influence degree
of target commitment. For further differentiations of this new model of commitment from previous models, see Klein et al. (2012). Although it is anticipated that new measures of commitment will be developed in the future based on this new model, there is not one provided at this time. Previous measures by Meyer and Allen have been frequently used and provided a great deal of valuable information; thus, will be used in the context of this study, despite recent theoretical developments.

Based on the data cited above, it was anticipated that implicit job satisfaction would have a significant positive relationship with the measure of affective commitment, as examined by Boyd (2010). Boyd found a significant and positive relationship between affective commitment and each of the job satisfaction measures examined: \( r = .68 \) (MSQ; Weiss et al., 1967), \( r = .69 \) (OJS; Brayfield & Rothe, 1951), and \( r = .15 \) (Traditional Single Target Job Satisfaction IAT). Accordingly, it is anticipated that similar results will be observed in the current study where affective commitment will be positively related to each of the measures of job satisfaction.

**H3a:** There will be a positive relationship between affective commitment and each of the implicit and explicit job satisfaction measures.

In Boyd (2010), the relationship between affective commitment and the traditional IAT was positive, but not as strong as the relationships with the other explicit job satisfaction measures. Although this is anticipated to some degree due to common-method variance between the explicit measures, it is proposed in the current paper that the relationship could be enhanced by personalizing the implicit method. Given that the personalized measure of job satisfaction is proposed to more accurately target the attitude of the participant, it is anticipated that affective commitment would be more strongly related to the personalized versus the traditional implicit measure.
**H3b:** Affective commitment will be more strongly positively correlated with the personalized measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

**Job Involvement**

Job involvement is another organizationally-relevant attitude that has been examined in relation to job satisfaction. Job involvement refers to one’s psychological involvement in his or her job and the degree to which job performance is central to one’s self-image and self-esteem (Kanungo, 1982; Lodahl & Kejne, 1965). The two ends of the job involvement spectrum are states of involvement, when the core aspects of the self are fully engaged in the job in a positive manner, or alienation, when there is a separation of the self from the job as well as a loss of individuality (Brown, 1996).

Although the two constructs of job satisfaction and job involvement have been demonstrated to be empirically distinct (Brooke, Russell, & Price, 1988), job involvement has been considered to be one of the keys to satisfaction within the workplace (Brown, 1996). A meta-analysis by Brown found a mean corrected correlation of $r = .45$ between overall job satisfaction and job involvement. Boyd (2010) found a significant and positive relationship between job involvement and each of the job satisfaction measures examined: $r = .66$ (MSQ; Weiss et al., 1967), $r = .72$ (OJS; Brayfield & Rothe, 1951), and $r = .15$ (Traditional Single Target Job Satisfaction IAT). Accordingly, it is anticipated that similar results will be observed in the current study where job involvement will be positively related to each of the measures of job satisfaction.

**H4a:** There will be a positive relationship between job involvement and each of the implicit and explicit job satisfaction measures.
Similar to affective commitment, the relationship between job involvement and implicit job satisfaction was not as strong as with the explicit job satisfaction measures. Moreover, it is also proposed that this relationship may be enhanced by the personalized versus traditional implicit measure of job satisfaction.

**H4b:** Job involvement will be more strongly positively correlated with the personalized measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).
Chapter 8: Relationships between Job Satisfaction and Organizationally-Relevant Behaviors

The presumed relationship between job satisfaction and behavior has sustained many decades of research on this relationship (Fisher, 2003). Even though the relationships may not be as strong or consistent as anticipated based on a priori assumptions, there are significant relationships between job satisfaction and various organizationally-relevant behaviors, warranting the further investigation of these associations. The behaviors investigated in the current study are organizational citizenship behaviors, counterproductive work behaviors, lateness, absence, and turnover intentions.

Organizational Citizenship Behaviors

Organizational citizenship behaviors (OCBs) have been found to be positively related to job satisfaction in a number of studies (Organ & Ryan, 1995; Podsakoff, MacKenzie, Paine, & Bachrach, 2000). Defined as behaviors that go beyond the formal requirements of the job and serve to benefit the ongoing success of an organization (Smith, Organ, & Near, 1983), OCBs have commonly been divided into two categories: altruism and compliance (Smith et al., 1983). Altruism refers to behaviors that help another individual that are not required within the job, such as orienting a new employee or helping a colleague with a heavy workload. Compliance refers to behaviors that help the organization as a whole, as opposed to a single individual, and are based on rule-following, such as arriving at work on time and completing the required tasks for the day. Both factors have been shown to be related to job satisfaction. For example, Organ and Ryan (1995) conducted a meta-analysis and found a mean corrected correlation of $\rho = .28$ between OCBs (both altruism and compliance) and job satisfaction. Boyd (2010) extended this research and examined the relationship between OCBs and implicit job satisfaction. Boyd found
a significant and positive relationship between OCB and each of the job satisfaction measures examined: \( r = .30 \) (MSQ; Weiss et al., 1967), \( r = .45 \) (OJS; Brayfield & Rothe, 1951), and \( r = .15 \) (Traditional Single Target Job Satisfaction IAT). Thus, it is anticipated that the current study will replicate this finding with the current existing measures of job satisfaction, as well as extend this relationship to the newly proposed implicit measure of job satisfaction.

**H5a:** There will be a positive relationship between reported OCBs and each of the implicit and explicit job satisfaction measures.

The weakest relationship in prior research (Boyd, 2010) was between OCBs and the implicit measure. This is assumed to be measurement error, as theoretically these measures were predicted to have a significantly positive relationship. The current study seeks to strengthen that relationship by developing a personalized version of the implicit measure of job satisfaction. The personalized implicit measure is proposed to capture the participant’s attitude more precisely than the traditional implicit measure; therefore, it is expected that the relationship with the OCB measure will be stronger with the personalized rather than the traditional measure.

**H5b:** Reported OCBs will be more strongly positively correlated with the personalized implicit measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

**Counterproductive Work Behaviors**

Significant relationships have also been found between job satisfaction and less desirable work behaviors such as counterproductive work behaviors and withdrawal behaviors. Counterproductive work behaviors (CWB) include a variety of voluntary behaviors aimed at harming the organization or its members, such as sabotage, theft, or
aggression (Fox, Spector, Goh, & Bruursema, 2007). A useful categorization of CWBs was developed by Robinson and Bennett (1995) that divides CWBs into two groups, based on the target. These are behaviors that target the organization (CWB-O), such as purposely working too slowly, and behaviors that target persons within the organization (CWB-P), such as gossiping about co-workers. Fox et al. (2007) found a correlation of $r = -.34$ between job satisfaction and CWB-O. The correlation between job satisfaction and CWB-P was smaller and not significant. Similarly, Fox and Spector (1999) found a correlation of $r = -.45$ between job satisfaction and CWB-O. Given these research findings, the current study will only examine CWB-O and not CWB-P. Furthermore, the current research is focused on an employee’s job satisfaction, not behaviors towards a single member of the organization. This research was extended to implicit measures by Boyd (2010). The findings replicated previous research with respect to the explicit measures of job satisfaction, where CWB-O was significantly and positively related to both explicit measures, $r = -.47$ (MSQ; Weiss et al., 1967) and $r = -.46$ (OJS; Brayfield & Rothe, 1951); however, the relationship with the implicit measure was not significant, $r = -.08$ (Traditional Single Target Job Satisfaction IAT). Accordingly, it is anticipated that these results will be replicated in the current study.

**H6a:** There will be a negative relationship between reported CWBs and each of the explicit job satisfaction measures and the personalized implicit measure of job satisfaction (P-IAT).

Given that the personalized measure of implicit job satisfaction is proposed to be more precise than the traditional IAT in accessing one’s attitude towards their work, it is anticipated that the personalized measure will be more strongly related to CWBs than the
traditional measure. The traditional IAT was not found to be significantly correlated with CWBs in Boyd (2010), thus no main effect for this relationship will be proposed.

**H6b:** Reported CWBs will be more strongly negatively correlated with the personalized implicit measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

**Withdrawal Behaviors**

The relationship between job satisfaction and other behaviors that negatively affect organizations has also been investigated for a grouping of actions referred to as withdrawal behaviors (Farrell & Stamm, 1988; Griffeth, Hom, & Gaertner, 2000). These withdrawal behaviors include lateness, absence, and turnover.

Absence is thought to result from an employee’s desire to avoid aversive work circumstances, according to the withdrawal model (Johns, 1997). Thus, job satisfaction is presumed to be related to absence. Many studies have examined the relationship between job satisfaction and absence with differing results (Farrell & Stamm, 1988). Farrell and Stamm conducted a meta-analysis of these studies and found a mean corrected correlation of $r = -0.16$ between absence (total time lost) and job satisfaction. A mean corrected correlation of $r = -0.24$ was found between absence (frequency) and job satisfaction. Several other meta-analyses provide similar results estimating the relationship between job satisfaction and absence to have corrected correlations ranging from the low to mid .20s (Johns, 1997). Boyd (2010) investigated this relationship in the context of implicit job satisfaction with interesting results. Previous research indicates potential explanatory power in assessing the reason for absence (e.g., Dalton & Mesch, 1991), thus this was explored in Boyd (2010). Both measures of absence (total number
of days absent, number of days absent for voluntary reasons) were significantly related to one of the explicit job satisfaction measures (OJS; Brayfield & Rothe, 1951), $r = -.20$, -.26, respectively. The other explicit job satisfaction measure (MSQ; Weiss et al., 1967) was significantly related to number of days absent for voluntary reasons, $r = -.22$, but not to total number of days absent. The implicit measure of job satisfaction was not significantly related to either form of absence. Siers and Peters (2011) used a variant of the traditional IAT, the Single Category IAT (SC-IAT), to investigate the relationship between job satisfaction and absence. They found that implicit job satisfaction was significantly related to frequency of unexcused absences over the past year, $r = -.48$, but not to excused absences. However, contrary to other research, self-reported job satisfaction was not related to either form of absence. Given that the length of time over which absences were assessed differed between the two studies, 3 months (Boyd, 2010) and 1 year (Siers & Peters, 2011), an absolutely direct comparison is difficult. However, the discrepancy in the results between the two studies is interesting given the similarity of the nature of the items. Both lengths of time with respect to absence will be assessed in the current study to provide a basis for direct comparison to both studies. Given the theoretical basis and the results of Siers and Peters (2011), the current study hypothesizes a negative relationship between absence and implicit job satisfaction, despite the lack of relationship found in Boyd (2010).

**H7a**: There will be a negative relationship between absence and each of the implicit and explicit job satisfaction measures.

As with the other organizationally-related variables, it is anticipated that the personalized IAT will be more precise in accessing one’s attitude towards work;
therefore, will have a stronger relationship than the traditional IAT with self-reported work behaviors of absence.

**H7b:** Absence will be more strongly negatively correlated with the personalized implicit measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

Similar to absence, the relationship between lateness and job satisfaction has been shown to be somewhat small, but significant. Iverson and Deery (2001) found a negative relationship \( r = -.15 \) between lateness and job satisfaction. In a meta-analysis, Koslowsky, Sagie, Krausz, and Singer (1997) found a mean corrected correlation of \( r = -.11 \) between lateness and general job satisfaction. In Boyd (2010), lateness (frequency and average length) was not related to either of the explicit job satisfaction measures. However, implicit job satisfaction was significantly related to frequency, but not length, of lateness although in the opposite direction of predicted, \( r = .17 \). Furthermore, implicit job satisfaction predicted additional variance, above and beyond that of the explicit job satisfaction measures, in this variable of frequency of absence.

Explanations in previous research (Koslowsky et al., 1997) for the finding of a small *negative* relationship between explicit job satisfaction and lateness have suggested that the causal influence may go in either direction, with lateness as an antecedent or consequence of job satisfaction. Thus, a potential explanation for the interesting reversal found by Boyd is that being able to be late to work may increase implicit job satisfaction, with lateness operating as an antecedent to job satisfaction. Given that implicit attitudes are less consciously accessible or subject to socially desirable responding than explicit measures, implicit job satisfaction may be tapping a different area of the construct of job satisfaction and thus may display a different relationship with lateness. Considering this is a result from a single study and contrary to the
theoretically proposed relationship, it is important for additional research to explore the potential replicability of this finding. However, in line with theoretical predictions and the base of prior research findings it is anticipated that all forms of explicit and implicit job satisfaction will be negatively related to lateness.

**H8a:** There will be a negative relationship between lateness and each of the implicit and explicit job satisfaction measures.

In line with prior hypotheses, it is anticipated that the personalized IAT will have a stronger relationship than the traditional IAT with self-reported variables such as lateness. However, given the tentative relationship between absence and job satisfaction in prior research, it is anticipated that this relationship may be of a small magnitude.

**H8b:** Lateness will be more strongly negatively correlated with the personalized implicit measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

A final withdrawal behavior examined in relation to job satisfaction in this study is turnover, or quitting one’s job. A meta-analysis conducted by Griffeth et al. (2000) found a mean corrected correlation of $\rho = -.17$ between turnover and job satisfaction. Ideally, turnover studies use a longitudinal design in order to measure job satisfaction to predict future turnover; however, given the cross-sectional nature of the current study, actual turnover cannot be assessed and measures of behavioral intention to remain in the current job will be obtained instead. Research has demonstrated that there is a positive relationship between turnover intentions and actual turnover (Griffeth et al., 2000). Boyd (2010) examined turnover intentions and found that one measure (response to “It would take me a lot to leave my employer”) was significantly related to implicit job satisfaction,
\( r = -0.15 \), although intended length of tenure was not. Using the SC-IAT, Siers and Peters (2011) found implicit job satisfaction to be significantly negatively related to turnover intentions, \( r = -0.33 \), using items developed by the authors. The current research will investigate several forms of turnover intention to further explore the relationship with implicit job satisfaction, including those in Siers and Peters’ study.

**H9a:** There will be a negative relationship between turnover intention and each of the implicit and explicit job satisfaction measures.

Similar to the predictions with some of the other organizationally-related variables, it is anticipated that turnover intention will be more strongly related to the personalized IAT than the traditional IAT.

**H9b:** Turnover intention will be more strongly negatively correlated with the personalized implicit measure of job satisfaction (P-IAT) than the traditional implicit measure of job satisfaction (IAT).

As discussed earlier, one of the strengths of implicit measures is the ability to predict behaviors better than explicit measures in some circumstances (e.g., Greenwald et al., 2009). In the current study, it is anticipated that implicit job satisfaction will have a significant relationship with several of the organizationally-relevant attitudes and behaviors as hypothesized above; however, it is not proposed that either of the implicit job satisfaction measures will outperform the explicit job satisfaction measures in predicting these variables, thus no formal hypotheses were created. Although, it is anticipated that the personalized implicit measure will provide unique variance above and beyond that of the explicit job satisfaction measures, as recent research has demonstrated; thus, will be investigated in the current study. For example, Dal Cin et al. (2007) found
that an implicit measure of self-smoking associations uniquely predicted intention to smoke above and beyond explicit smoking beliefs. Similarly, Von Hippel et al. (2008) found in a sample of nurses that negative implicit prejudices about drug users mediated the relationship between stress and intentions to quit, above and beyond explicit measures of prejudice and satisfaction.

Boyd (2010) investigated the unique incremental variance explained of the traditional implicit measure of job satisfaction above that of the explicit job satisfaction measures and only found significant results in one variable, frequency of lateness; however, as discussed earlier, this relationship was positive, which was in the opposite direction than predicted. The IAT explained additional variance, above and beyond the two explicit measures of job satisfaction, $\Delta R^2 = .027$, $F(1, 181) = 4.99$, $p < .05$.

Moreover, according to relative weights analysis, the overall variance explained in the lateness dependent by all three job satisfaction measures was $R^2 = .03$, of which the IAT accounted for 88.6%, whereas the other two explicit job satisfaction measures only accounted for 2.9% (OJS) and 8.6% (MSQ). Similar small incremental variance is expected in the current study as well.

**H10a**: The personalized implicit measure of job satisfaction (P-IAT) will explain unique variance in OCB, above and beyond the variance explained by the explicit job satisfaction measures alone.

**H10b**: The personalized implicit measure of job satisfaction (P-IAT) will explain unique variance in CWB, above and beyond the variance explained by the explicit job satisfaction measures alone.

**H10c**: The personalized implicit measure of job satisfaction (P-IAT) will explain
unique variance in absence, above and beyond the variance explained by the explicit job satisfaction measures alone.

**H10d:** The personalized implicit measure of job satisfaction (P-IAT) will explain unique variance in lateness, above and beyond the variance explained by the explicit job satisfaction measures alone.

**H10e:** The personalized implicit measure of job satisfaction (P-IAT) will explain unique variance in turnover intentions, above and beyond the variance explained by the explicit job satisfaction measures alone.

In each of these hypotheses, only the P-IAT will be examined against the explicit measures of job satisfaction. The shared variance between the two implicit measures may be too large and obscure the explanatory value of the implicit measure beyond the explicit measures. However, if it is the case that these hypotheses are supported and significant unique variance is explained by the P-IAT, then the IAT will be added to the analysis on an exploratory basis to determine if the P-IAT explains unique variance above and beyond that of the IAT and explicit job satisfaction measures together.

Given that both of these measures are anticipated to be related to the explicit job satisfaction measures, the additional variance explained by the P-IAT beyond the IAT may be small. However, as discussed earlier, explaining even small additional variance in outcome measures in the work domain can have a significant impact. Increasing productivity or decreasing theft by even less than one percent, when applied across the organization, could save millions of dollars. Thus, enhancing the explanatory power of a measure by small amounts can be impactful (Ableson, 1985).

Finally, this paper will explore several of the organizationally-relevant attitudes
and behaviors listed above with a different referent of perspective. In addition to asking self-report items for these variables, participants will also be asked to provide their perspective on how their managers and co-workers would rate them on several of the attitudes and behaviors. For example “rate the degree to which the item is characteristic of you” is modified to “degree to which those who you work with would say the item is characteristic of you” (see Appendix O for the full list of items). Implicit measures predict implicit behaviors particularly well (e.g., Greenwald et al., 2009). Although assessing one’s perception of what his or her managers and co-workers is not behavioral, it provides additional psychological distance from the construct of interest and may be able to circumvent some of the self-presentational limitations of self-report measures. Research has found that self-presentational bias is in fact reduced by indirect questioning, where participants are asked to respond based on another person’s perspective (Fisher, 1993). Responses to indirect questions provide a more accurate assessment of an individual’s true beliefs, rather than direct questions, particularly with socially-sensitive topics (Fisher & Tellis, 1998). The theoretical rationale is that the respondents project their own attitudes and behaviors onto the referent individual (e.g., Calder & Burnkrant, 1977). Thus, the current study will explore attitudes from the perspective of other individuals that the employee works with (heretofore referenced as “other perspective” items). In line with related research, it is anticipated that these other perspective items would be more strongly related than the self-report measures to the implicit measures. However, it could also be argued that these items are measuring a different construct (someone else’s perspective). Accordingly, no formal hypotheses will be made at this time in regards to the other perspective items; instead, relationships between these items
and the self-report and implicit measures will be explored.

Summary

The current paper seeks to examine the effect of personalizing an implicit measure in the domain of job satisfaction, which has not been studied previously, and examining this measure in relation to organizationally-relevant attitudes and behaviors. By building and expanding on prior research which created a traditional implicit job satisfaction measure (Boyd, 2010), the current research attempts to develop and validate a new implicit measure of job satisfaction, that more accurately accesses one’s implicit attitude towards work than prior measures. Study 1 focuses on providing initial construct validity evidence for this new personalized measure through a full MTMM study, comparing it to existing implicit and explicit measures, to determine underlying latent factor structure of the measures. Study 2 seeks to provide criterion-related validity evidence by examining the relationship of this new personalized implicit job satisfaction measure in relation to organizationally-relevant attitudes and behaviors. Both of these studies will utilize a non-experimental design with employed individuals.
Study 1

The first study sought to provide initial construct validity evidence for the new personalized implicit measure of job satisfaction. Convergent and discriminant construct validity evidence was assessed between the implicit personalized, implicit non-personalized, and explicit job satisfaction measures, as well as with implicit and explicit measures of the unrelated construct of Christianity.

Method

Participants. Participants were employed students from a large, northeastern university. They volunteered to participate in this study in exchange for partial course credit. Only students who were currently working a minimum of 15 hours per week within the customer service industry were allowed to participate. A pre-qualifying question was provided to participants to clarify who was eligible for participation in the study (see Appendix A). This convenience sample was limited to students as the IAT program is required to collect this data and is limited to the licensed computers within the psychology lab. Student samples are commonly used in IAT research (e.g., Greenwald et al., 2009) and Boyd (2010) found the student sample to be sufficiently diversified in terms of demographic characteristics.

In order to determine required sample size, a power analysis is often utilized. However, for CFA analyses there is a large range of recommended sample size guidelines, from as little as 60 up to 500 or more (e.g., MacCallum, Widaman, Zhang, & Hong, 1999). These guidelines are based on a variety of factors such as the number of items, maintaining a specific subject to variable ratio, or a general rule of thumb minimum. MacCallum et al. (1999) have suggested that these general guidelines are not sufficiently valid tools alone and that other aspects of the data need to be considered, such a level of communalities between variables and how many
items per variable are included. For example, if there are high levels of communality (.6 or more) across all variables, sample size becomes less important and samples less than 100 are sufficient to determine model fit. Moderate levels of communalities (.5) indicate that sample size is more important and if the analysis has few factors as well as several items (six or seven) per factor, a sample size in the range of 100 to 200 is suggested. Finally, for low levels of communality when there are only a few items per factor (three or four) and several factors are in the model, sample sizes of 300 are recommended. Thus, the lower communality, less items per factor, and more factors indicates larger required sample sizes. The communalities of the variables in the current paper were expected to be low to moderate, as there are several variables measuring each of two constructs, which should have moderate communality within each construct and low communality between the constructs. There were seven main variables in the CFA analysis, each of which have three to 36 items, and it was anticipated that a four factor latent model would provide the best solution. Thus, based on MacCallum et al.’s (1999) work, a sample size of 200 to 300 would be appropriate.

Another method of determining appropriate sample size is to examine other relevant research within the same domain. For example, CFA analyses were conducted by Cunningham et al. (2001) with one explicit and three implicit measures, resulting in a four factor solution. The communalities of the variables were moderate to high and the sample size was 93. Nosek and Smyth (2007) examined 7 IATs of two contrasting constructs as well as explicit measures, where the communalities were extremely low and used a sample size of 287. Based on these references, the current study falls within the range of these two studies in terms of number of factors, constructs, and communalities. Thus, the recommended sample size would also fall somewhere in the range of 93 to 287. As a result, the current study sought to obtain a sample
size of 220.

**Measures**

**Non-personalized implicit job satisfaction.** The non-personalized implicit job satisfaction measure (IAT) was developed in Boyd (2010) based on the Single-Target IAT (ST-IAT; Wigboldus et al., 2004). This IAT assesses response latencies between pairing of a single target category (e.g., animal) and attributes (e.g., good and bad) to determine an overall index of implicit attitude towards the category object (e.g., animal) through the desktop version of Millisecond’s Inquisit software program that was designed to deliver IATs². In all trials, the category (“work”) and attributes (“good” and “bad”) are located in the upper-right or upper-left corners of the computer screen. All stimuli (positive, negative, and work-related words) are presented in the middle of the screen and participants are required to sort these words depending on where the labels are located. The IAT consists of five trials, the third and fifth of which are critical to final scoring (see Appendix B). Using the “E” and “I” keys on a keyboard, the first trial requires participants to sort positive words (e.g., “wonderful”) into the left attribute category (“good”) by pressing the “E” key and negative words (e.g., “horrible”) into the right attribute category (“bad”) by pressing the “I” key. Starting with the “E” or “I” key is counterbalanced. The second trial presents participants with three different types of stimuli: positive words, negative words, and work-related words. Participants practice sorting the positive words into the left-side category (“good”) and negative words or work-related words are sorted into the right-side category (“bad” or “work”). The first and second trials serve as practice trials to allow the participant to become accustomed to the sorting task and the key assignments. The third trial is identical to the second, but it is a “critical” trial that contributes to the final index of implicit job satisfaction. The fourth trial presents the same stimuli as in the second trial except the “work”
target category is switched to the left-side of the screen. In this practice trial, participants sort stimuli into the left-side category of “good or work” or into the right-side category of “bad”. The fifth and final trial is identical to the fourth trial, but is considered a “critical trial” and therefore contributes to the final index of implicit job satisfaction.

The interstimulus interval, length of time the next stimulus is presented after a correct response, is set to 250 milliseconds. If participants provide an incorrect answer, a red “X” appears below the stimulus. To move onto the next stimulus word, the participant is required to press the correct key. In order to enhance comparability with Siers and Peters (2011), the same five positive and five negative words representing the attribute categories of “good” and “bad” were used as in their study, which they identified as the most extremely valenced adjectives to describe the workplace. The work-related words were chosen to represent individuals within the customer service industry (e.g., consumer, service, assistance), while maintaining the format of a single word. The stimuli were selected from descriptors for customer service representatives identified by National Center for O*NET Development (2014), as well as using synonyms for the word “customer”. These words were pilot tested to ensure they are perceived to be relevant to customer service jobs by the participants in this study.

In prior research, Boyd (2010) suggested that a potential reason for not finding as strong relationships as anticipated with the measure of implicit job satisfaction and other explicit measures could be due to the stimulus words chosen. Boyd (2010) selected basic work-related words (e.g., my job, my occupation, my pay, etc.) and suggested that participants may have been evaluating work as a concept instead of their own job. To increase the salience of participants’ own jobs, a free-write activity was incorporated into the procedures (discussed further below) and stimuli were selected that are specific to the industry of customer service. Customer service
jobs were selected as the focus of this study for two reasons: (a) it is one of the top 10 occupations with the highest growth in the next decade according to the U.S. Bureau of Labor Statistics (2013) and thus a relevant population for the future, and (b) it is a sample of convenience given the population at the study location. It was likely that a large number of students in this population will currently be working in customer service jobs. For a list of all of the IAT stimulus words, see Appendix C.

To determine an IAT score, the revised IAT scoring algorithm was used (Greenwald et al., 2003), which has been demonstrated to resolve several criticisms of earlier IAT research (e.g., Brendl, et al., 2001; Rothermund & Wentura, 2004). Essentially, the scoring algorithm calculates the difference in average response latency between the two sorting conditions and then is divided by the standard deviation of all latencies for both sorting tasks. This is accomplished through log-transforming response latencies from both the practice trials and the two critical trials of the IAT. The resulting IAT $D$ score is similar to Cohen’s $d$, although a key difference is that standard deviation in the denominator of $d$ is a pooled within treatment standard deviation, whereas the IAT $D$ ignores the condition of membership of each score (Nosek, Greenwald, & Banaji, 2005). Thus, the implicit job satisfaction score represents the difference between the average speed at which “work” and “good” are paired together versus “work” and “bad” during the latter four trials. Larger scores indicate higher levels of implicit job satisfaction or dissatisfaction. Response latencies of a single pairing longer than 10,000 milliseconds (ms) were recoded to 10,000 ms. Higher scores indicate higher levels of implicit job satisfaction. Positive scores indicate job satisfaction, a score of zero indicates neither satisfaction nor dissatisfaction, and negative scores represent dissatisfaction.

**Personalized implicit job satisfaction.** The personalized implicit job satisfaction
measure (P-IAT) was developed for the current study. It is based on the traditional IAT as detailed above, with a few modifications. The attribute labels were changed from the standard “Good” and “Bad” to “I like” and “I don’t like”. Given that the participants are now sorting terms into categories based on whether or not they like an item, error feedback is not appropriate and thus removed. These are the two key differences for the personalized versus traditional IAT. Otherwise, the measure and index calculation are similar to the IAT as described above.

Explicit job satisfaction. The Job Satisfaction Survey (JSS; Spector, 1997) was used as an explicit measure of job satisfaction. This scale consists of 36 items, which measure nine facets (satisfaction with pay, promotion opportunities, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, communication) of job satisfaction. Each facet is assessed by four items. The items are rated on a 6-point Likert-type scale, with disagree very much and agree very much as the anchors. Several items are reverse-scored. To determine an overall JSS score, the responses to all 36 items are summed. Subscale scores are created by summing responses to the four items that assess the facet. Higher scores indicate a higher level of job satisfaction. A sample item is “My job is enjoyable.” A complete list of items can be found in Appendix D. The internal consistency of responses to the all of the items on this scale in previous research was .91 (Spector, 1997). In a review of the reliability and validity of job satisfaction measures amongst each other, the JSS was one of the few that met the standards for both criteria (Van Saane, Sluiter, Verbeek, & Frings-Dresen, 2003). In a longitudinal study by Blau (1999), the scores on the JSS were found to have an internal consistency of .89 and were positively correlated positively with expected variables such as professional commitment in previous years.

The Overall Job Satisfaction (OJS; Brayfield & Rothe, 1951) scale was used as an
explicit measure of job satisfaction. This scale consists of 18 items. The items are rated on a 5-point Likert-type scale, with strongly disagree and strongly agree as the anchors. Several items are reverse-scored. To determine an overall OJS score, the responses to all 18 items are summed. Higher scores indicate a higher level of job satisfaction. A sample item is “Most days I am enthusiastic about my work.” The internal consistency of responses to the items on this scale in previous research was .91 (Boyd, 2010) and .92 (Schleicher, Watt, & Greguras, 2004). Similarly, convergent validity evidence has been demonstrated with other job satisfaction measures in prior research, such as with the MSQ (Weiss et al., 1967): \( r = .63 \) (Schleicher et al., 2004) and .75 (Boyd, 2010). A complete list of items can be found in Appendix E.

The short form of the Minnesota Satisfaction Questionnaire (MSQ; Weiss et al., 1967) was used as an explicit measure of job satisfaction. This measure consists of 20 items, rated on a 5-point Likert-type scale, with very dissatisfied and very satisfied as the anchors. There are no reverse-scored items. To determine an overall MSQ score, the responses to all 20 items are summed. Higher scores indicate a higher level of job satisfaction. A sample item is “On my present job, this is how I feel about the chances for advancement on this job.” The internal consistency of responses to the items in this scale in previous research was .89 (Boyd, 2010). Field (2002) reported that in several studies, the scores on the MSQ were found to have coefficient alpha values ranging from .85 to .91, and was empirically distinct from other related attitudes such as organizational commitment and job involvement. A complete list of items can be found in Appendix F.

Furthermore, the reason for selection of these three explicit job satisfaction measures is for comparability with the previous research that has examined implicit attitudes in the domain of job satisfaction (e.g., Boyd, 2010; Siers & Peters, 2011). This is in addition to the validity
evidence discussed above for each.

**Implicit attitude towards Christianity.** In order to provide discriminant validity evidence with the measure of implicit job satisfaction, this non-personalized implicit measure served as a same-method measure of an unrelated construct. This measure was developed by Wigboldus et al. (2004) in the original paper to introduce and provide initial construct validity evidence for of Single-Target implicit measures. The current measure assesses implicit attitudes towards Christianity using the same procedure and method of calculating an index score as the non-personalized implicit measure of job satisfaction detailed above. The only difference is in the category heading (“Christianity”) and the stimuli (Appendix C). Although different from Wigboldus et al. (2004), the positive and negative stimuli are the same as the other IAT measures in the current study to maintain consistency.

**Explicit attitude towards Christianity.** This measure served as the different-method measure of an unrelated construct in order to provide additional discriminant validity evidence with the measure of implicit job satisfaction. The three relevant items from Wigboldus et al. (2004) were used. Participants were asked to indicate on a 7-point scale ranging from totally disagree to totally agree to what extent they agreed with the following propositions: “I am positive about Christianity” and “I am negative about Christianity” (reverse-scored). Also, they were asked to indicate on a 9-point scale ranging from extremely negatively (-4) to extremely positively (4) how they evaluate the Christian religion. To determine a total score for these three items, responses were standardized and averaged, with higher scores representing more positive attitudes towards Christianity. A complete list of items can be found in Appendix G.

**Demographic characteristics.** A variety of demographic items were included at the end of the explicit measure section including gender, race, age, tenure, industry, hours worked, type
of job, and position title. For a list of all demographic items, see Appendix H.

**Procedure**

Participants volunteered for available sessions through the online participant pool of the Department of Psychology. The sign up instructions indicated that the participant must be currently employed in a customer service job and work at least 15 hours per week. Upon arrival to the lab, participants were reminded of these requirements, and then completed the informed consent procedure.

Participants began the study by writing a short open-ended essay about their job (instructions in Appendix I). Prior research has indicated that by activating a relevant concept via a writing exercise, the relationship between IAT measures and behaviors is enhanced (Perugini & Prestwich, 2007). Thus, priming the target object (a participant’s job), is the purpose of this exercise and has been used in other research (Siers & Peters, 2011). Next, participants completed all of the explicit job satisfaction measures and the explicit measure of attitudes towards the Christian religion, which were presented in a randomized order. Randomization equally distributes potential order effects across participants. Without randomization, there is potential concern for reactivity between the measures, such that completing some measures affects the responses on later measures. The participants were then directed to complete three implicit measures: personalized and non-personalized job satisfaction and attitudes towards the Christian religion, which were presented in a counterbalanced order, determined randomly, followed by demographic questions. At the completion of the study, participants were debriefed and thanked for their participation.

Meta-analytic results have investigated the potential influence of order effects when administering both implicit and explicit measures; however, they have concluded that order does
not have a significant influence for the purpose of predictive validity studies (Greenwald et al., 2009; Hofmann et. al, 2005). Moreover, Boyd (2010) tested for order effects between explicit and implicit measures and none were observed. Thus, in the current study, all of the explicit measures were administered first, followed by the implicit measures. However, the literature is less clear on the potential order effects when administering multiple implicit measures. Therefore, the implicit measures were counterbalanced and order effects were ascertained before combining the results.

**Data Analysis**

**Descriptive statistics.** Total scores or mean scores were computed for each of the scales as necessary. Descriptive statistics and exploratory data analysis, including means, standard deviations, box plots, skewness, correlations, and internal consistency reliability estimates for the each of the scale scores were calculated before testing the hypotheses. Pairwise deletion was used for missing data.

**Test for order effects.** A test of order effects was conducted to assess if the order of presentation of the three implicit measures had a significant effect on responses. An ANOVA was conducted between each condition of the implicit measures scores to determine whether order effects are present.

**Tests of hypotheses.** In order to test H1 and H2, first, simple Pearson correlations were calculated between the each of the variables of interest, providing preliminary information as commonly used in traditional MTMM analyses. The need for correction for unreliability was assessed but was not necessary. In accordance with the MTMM framework, correlations of measures assessing the same trait using the same method (monotrait, monomethod) should be the highest; followed by correlations between measures assessing the same trait with different
methods (monotrait, heteromethod) which should be larger than that of measures assessing different traits with the same method (heterotrait, monomethod); finally, the smallest correlations should be represented by measures assessing different traits with different methods (heterotrait, heteromethod). Cohen (1992) was used as a guide where small, medium, and large effect sizes for $r^2$ are valued at .10, .30, and .50, respectively.

In order to directly test H1 and H2, confirmatory factor analysis was conducted using LISREL v. 8.5. Several goodness of fit indices were examined to evaluate overall model fit. The chi-square test should be as small as possible, close to the number of degrees of freedom, and preferably not significant (Schumacker & Lomax, 2010). Root Mean Square Error of Approximation (RMSEA) values of .06 or less have indicated good model fit (Hu & Bentler, 1999) and values of 0.8 represent mediocre fit (MacCallum, Browne & Sugawara, 1996). The lower value of the 90% confidence interval around RMSEA should include or be very close to zero and the upper value should be less than 0.8, as with RMSEA, for good model fit. Values of 0.95 and higher suggest acceptable model fit for both the Goodness-of-fit Index (GFI; Schumacker & Lomax, 2010) as well as Comparative Fit Index (CFI; Hu & Bentler, 1999).

Model 1 (Figure 1) examined the observed (first order) variables and specify two (second order) latent factors based on method (implicit and explicit) to account for the covariances between the observed variables. A null model where no relationship exists between the variables at all was not tested as it was not expected to be a good fit for the data.

Model 2 (Figure 2) expands upon Model 1 by specifying two additional second order factors, one for each of the constructs of interest (job satisfaction and attitudes toward Christianity). It was anticipated that this model would demonstrate an improvement in fit beyond Model 1; however, it would not fit as well as Model 3. Model 3 (see Figure 3) directly
tests the hypothesis of distinct but related implicit and explicit attitude factors, as demonstrated in prior IAT research (e.g., Greenwald & Nosek, 2009). Thus, this model of four latent factors (implicit job satisfaction, explicit job satisfaction, implicit attitudes toward Christianity, explicit attitudes toward Christianity) provides both convergent and discriminatory validity evidence within the MTMM framework.

Finally, it was anticipated that the two implicit job satisfaction measures would demonstrate convergent validity evidence when examined within the context of all of the other study variables, given the additional variance accounted for by these variables. However, if these measures were to be examined alone, it was expected that they would each form their own latent factors, providing discriminatory validity evidence (Hypothesis 2). Thus, a fourth model (Figure 4) was examined that separates the implicit job satisfaction into two latent factors, specifying a five factor model. However, it was anticipated that Model 3 would provide superior model fit over Model 4.

Hypothesis 2, indicating a two factor model when the non-personalized and personalized implicit job satisfaction models are examined alone, was examined separately. In this model (Figure 5), it is anticipated that a two factor model will be a superior fit to a single factor model. Criteria for determining model fit were the same as used for testing Hypothesis 1.
Study 2

The second study sought to provide criterion-related validity evidence for the new personalized implicit measure of job satisfaction. This initial evidence was examined by evaluating convergent and discriminatory validity evidence with existing explicit and implicit measures of organizationally-relevant attitudes and behaviors.

Method

Participants. As in Study 1, participants were employed students from a large, northeastern university who volunteered in exchange for partial course credit. Students were required to be currently working a minimum of 15 hours per week within the customer service industry. According to a power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) for a regression analysis with four predictors, a sample of 114 respondents is needed to achieve power $= .095$ with a medium effect size and a type one error rate of 5%.

Measures

Job satisfaction. The non-personalized and personalized implicit measures of job satisfaction were presented, as well as the three explicit measures of job satisfaction, as detailed in Study 1.

Organizational commitment. The Organizational Commitment Scale (OCS; Meyer, Allen, & Smith, 1993) was used which consists of 18 items. The OCS consists of three components of organizational commitment: affective, continuance, and normative commitment. Each of these subscales is measured by 6 items of the OCS. The 18 items are scored on a 7-point Likert-type scale, with strongly disagree and strongly agree as the anchors. Several items are reverse coded. To determine an overall commitment score for each component, the responses to the 6 items composing that component are averaged. Higher scores on each of these subscales
indicate stronger commitment to the organization. Sample items for each of the affective, continuance, and normative commitment are as follows, respectively: “I would be very happy to spend the rest of my career with this organization,” “I feel that I have too few options to consider leaving this organization,” “This organization deserves my loyalty.” The internal consistency of responses to the items in each of these subscales in previous research was .82, .74, .83, respectively (Meyer et al., 1993). A complete list of items can be found in Appendix J.

**Job involvement.** Paullay, Alliger, and Stone-Romero’s (1994) 27-item scale of job involvement was used. Each of the 27 items are rated on a 7-point Likert-type scale with disagree very much to agree very much as the anchors. Five items are reverse-scored. Higher scores indicate a higher degree of job involvement. A sample item is, “I am absorbed in the type of work that I do in my present job.” To determine an overall score, responses to each item are summed. The internal consistency of responses to these items in previous research was 0.91 (Paullay et al., 1994). A complete list of the items can be found in Appendix K.

**Organizational citizenship behavior.** The OCB measure created by Smith, Organ, and Near (1983) consists of 16 items, which comprise two dimensions of altruism and generalized compliance. The items are rated on a 5-point Likert-type scale, with not at all characteristic and very characteristic as the anchors. Several items are reverse-scored. The items are typically rated by a supervisor on how characteristic each item is of a particular employee; however, since participant’s employers could not be accessed, participants were asked to provide ratings for themselves for each of these items. To determine an OCB score for each dimension, the responses to the eight items making up that dimension are summed. Higher scores indicate a higher level of organizational citizenship behaviors. A sample item from the altruism scale is “Volunteers for things that are not required.” A sample item from the generalized compliance
scale is “Does not take extra breaks.” The internal consistencies of responses to the items in each of the dimensions are .88 and .85, respectively (Smith et al., 1983). A complete list of items can be found in Appendix L.

**Counterproductive work behaviors.** A portion of Fox and Spector’s (1999) list of counterproductive work behaviors was used. Sixteen items representing CWB towards the organization (CWB-O) are rated on a 6-point Likert-type scale with never to extremely often as the anchors. Responses are summed for a total CWB-O score. Higher scores indicate higher incidence of CWB. A sample item is “Purposely did your work incorrectly.” The internal consistency of responses to the items in this scale in previous research was .81 (Boyd, 2010). A complete list of items can be found in Appendix M.

**Absence.** To determine frequency of absence, participants were asked to provide an estimate of how many days they were absent from work in the last three months. As an additional exploratory measure, participants were asked to estimate the number of days they were absent in the last three months because they “didn’t feel like going to work” (Meyer et al., 1993) in order to distinguish voluntary from involuntary absences.

In order to make a more direct comparison with Siers and Peters (2011), two additional absence items were included. Participants were asked to indicate the number of excused and unexcused absences from work in the past year. A complete list of items can be found in Appendix N.

These types of absence measures are commensurate with widely employed measurement of absence in the literature. In a meta-analysis conducted by Farrell and Stamm (1998), absence measures that were included reflected total time and absence frequency. Johns (1994) provides a review of validity evidence for absence measures, and although he concludes that more research
is warranted, he does provide several guidelines when utilizing self-report absence measures. In this study, the following suggestions by Johns (1994) were incorporated: a period of time respondents are likely to remember (3 to 6 months), providing a free format response option in order to not influence the self-reported number, and suggesting the responses can be checked to enhance honest responding.

**Lateness.** To determine frequency of lateness, participants were asked to indicate how frequently they arrived for work at least ten minutes late in the last month and in the last six months. As an additional exploratory measure, participants were asked to report their average length of lateness in minutes and a reason for being late, developed by the author. A complete list of items can be found in Appendix N.

Per Blau’s (1994) recommendation, the current study sought to obtain more detailed information on the nature of lateness, which may allow for stronger relationships with other variables to be observed (Blau, 1994). Furthermore, as lateness and absence are within the same broader category of withdrawal behaviors, a similar item format was applied to lateness as well, providing a window of time respondents will likely be able to remember and an open-ended response format to reduce the influence on responses. Harrison (2002) does acknowledge the lack of validity evidence for withdrawal behaviors generally, but even more so for lateness. Recall can be an issue in self-reported lateness, so Harrison (2002) recommends using a shorter interval (than when measuring absence) and prompting the participant to think about lateness incidents before requesting them to report data. Both of these suggestions have been incorporated in the current study.

**Turnover intention.** In order to measure turnover intention, all six items from the turnover intention scale (TIS-6) were used (Bothma & Roodt, 2013). Each of the six items are
measured on a 5-point Likert-type scale; however, the scale anchors vary (e.g., “never and always” or “to no extent and to a very large extent”). A sample item is “How often do you look forward to another day at work?”. A higher score indicates a higher likelihood of leaving one’s current job. A complete list of turnover intention items can be found in Appendix N. The internal consistency of responses to the all of the items in this scale in previous research was .80 (Bothma & Roodt, 2013). Furthermore, the TIS-6 has demonstrated validity evidence of predicting actual turnover. A significant difference in TIS-6 scores was demonstrated between employees who resigned and a random sample of employees who remained, $t(170) = 5.20, p \leq 0.001$ (Bothma & Roodt, 2013). Significant differences in turnover intention between employees who stayed and resigned were also found with related variables such as work-based identity, emotional exhaustion, and personal accomplishment.

In order to make a direct comparison with previous research, additional turnover items were included as well. In line with previous research, Boyd (2010), each participant was asked to report their intention to stay in their current job for the next two years. This item is rated on a 5-point Likert-type scale, with very unlikely and very likely as the anchors. A higher score indicates a higher likelihood of staying in their current job for the next two years. An additional turnover intention item was presented assessing agreement with a statement indicating it would take a lot for the participant to leave their employer. This item is rated on a 7-point Likert-type scale, with strongly disagree and strongly agree as the anchors. A higher score indicates a higher likelihood of staying in their current job. These items are all in line with turnover intention measurement, as described in a meta-analysis by Tett and Meyer (1993). Items included in their study assessed the likelihood of leaving over varying time intervals and used reverse-scored items, such as intent to remain.
In line with Siers and Peters (2011), three additional turnover items were presented to participants: (a) I often think about quitting my job, (b) I would be happy staying at my job for the foreseeable future (reverse scored), and (c) I would take another job at the first opportunity. These items are rated on a 5-point Likert-type scale, with *strongly disagree* and *strongly agree* as the anchors. The internal consistency of responses to these three items was .82 in recent research (Siers & Peters, 2011). Using these items was intended to help to make a more direct comparison with the results of the current study. A complete list of turnover intention items can be found in Appendix N.

As an additional exploratory measure, and for direct comparison with Boyd (2010), participants were also asked to report how long they intended to stay in their current job on a 10-point scale representing lengths of time. This additional item can be found in Appendix N.

**Other perspective items.** Several items were included to measure organizationally-relevant attitudes and behaviors from another’s perspective. These items are similar to the self-report items posed above, but with a different referent. Participants were asked to answer these items about themselves from the perspective of a manager or co-worker. The goal was to assess these attitudes and behaviors in a more psychologically distant manner. See Appendix O for a list of all other perspective items.

**Demographic characteristics.** Demographic items were collected as well, as detailed in Study 1.

It should be noted that a measure of social desirability was not included in the current study, although it is frequently included in studies utilizing attitudinal and behavioral explicit measures. Although self-presentation concerns can influence the implicit-explicit relationship (e.g., socially-sensitive domains; Greenwald et al., 2009), measures of social desirability have
generally not been found to significantly moderate this relationship (e.g. Egloff & Schmukle, 2002); similarly, it was not found to be related to the implicit-explicit relationships in Boyd (2010). Therefore, it is not measured in this study.

**Procedure**

Participants began the study as detailed in Study 1 by writing a short open-ended essay about their jobs to serve as a priming measure. They then completed all of the explicit measures of job satisfaction in a randomized order. After this, participants read a statement that at the end of the study, they would be asked to provide contact information for their supervisor, so that data they are providing can be verified (see Appendix P). The purpose of this statement is to encourage accurate and honest responding, attenuating some of the dishonest responding, a limitation that explicit measures are subject to. Subsequently, participants completed explicit measures of organizational commitment, job involvement, OCB, CWB-O, absence, lateness, and turnover intention, presented in a randomized order as well. After completing the self-report measures, participants then completed the other perspective measures. They were then directed to complete both the personalized and non-personalized implicit measures of job satisfaction, presented in a counterbalanced order, followed by demographic questions.

**Data Analysis**

**Descriptive statistics.** Total scores or mean scores were computed for each of the scales as necessary. Descriptive statistics and exploratory data analysis, including means, standard deviations, box plots, skewness, correlations, and internal consistency reliability estimates for the each of the scale scores was calculated before testing the hypotheses. Pairwise deletion was used for missing data. Furthermore, a potential concern is participant fatigue with the number of measures for Study 2. Standard deviations from earlier and latter measures were compared to
determine if fatigue was a concern.

**Test for order effects.** A test of order effects was conducted to assess if the order of presentation of the two implicit measures had a significant effect on responses. An ANOVA was conducted between each condition of the implicit measures scores to determine the potential presence of order effects.

**Tests of hypotheses.** Study 2 builds upon the relationships explored through SEM analyses in Study 1, by examining outcome variables in addition to the main job satisfaction measures. In order to test, H3a, H4a, H5a, H6a, H7a, H8a, and H9a, simple Pearson correlations were calculated between the two variables of interest. The need for correction for unreliability was assessed but was not necessary. If needed, to test the hypotheses in which strength of correlations are compared, (H3b, H4b, H5b, H6b, H7b, H8b, and H9b) a t-test for dependent correlations would be conducted (Cohen & Cohen, 1983). Although these are essentially moderation analyses, due to the nature of the data traditional moderation analyses are not appropriate. In order to test for strength of the relationships as proposed in the hypotheses (e.g., strongly, moderately), Cohen (1992) was used as a guide, where small, medium, and large effect sizes for $r^2$ are valued at .10, .30, and .50, respectively.

Finally, several hypotheses examined the ability of the personalized implicit measure of job satisfaction to predict unique variance above and beyond the variance explained by the explicit measures of job satisfaction in the dependent variables of OCB (H10a), CWB-O (H10b), absence (H10c), lateness (H10d), and turnover intention (H10e). Each of these five hypotheses was tested using hierarchical regression techniques. In the first step of the regression equation the three explicit measures of job satisfaction were entered as independent variables and regressed onto the dependent variable (e.g., OCB, lateness, etc.). In the second step, the
personalized implicit measure of job satisfaction was entered as an independent variable and regressed onto the dependent variable. If the change in $R^2$ was significant, the hypothesis was supported.

A limitation of hierarchical regression is the influence of multicollinearity when using multiple predictors (LeBreton, Hargis, Griepentrog, Oswald, & Ployhart, 2007). If several predictors are highly correlated, the order in which the variables are entered into the regression equation severely impact the results. For example, with two highly correlated variables, the first variable entered into the regression equation may account for a great deal of the variance, making the second variable appears to be an insignificant contribution; however, if the order of the variables were reversed, an opposite conclusion may be reached.

Therefore these hypotheses were also examined using a secondary set of analyses, relative importance analysis using Johnson’s (2000) approach, in order to assess the degree of unique variance of the implicit measure above and beyond the explicit measures of job satisfaction, regardless of order in which the variables are entered into the regression equation. Johnson’s (2000) approach to relative importance analyses is relative weights analysis (RWA), which defines the relative importance of each predictor variable as the proportionate contribution made to $R^2$. This approach assesses both unique variance, when the predictor’s contribution is considered alone, and incremental variance, when the predictors are combined together (Budescu, 1993). Johnson’s (2000) approach transforms the predictor variables to their least squares equivalent in order to create a set of variables that are orthogonal and as similar as possible to the original variables.

The result of this approach to RWA is a relative weight for each variable that represents the contribution of variance in the prediction of the outcome variable, taking into account both
the variable’s contribution alone and in combination with other predictors. This value is the percentage of variance contributed to the overall prediction of the outcome variable, relative to the other predictor variables. It should be noted that extreme cases of multicollinearity will adversely affect RWA as well; however, RWA is less impacted by multicollinearity than hierarchical regression.

As noted earlier, the current set of hypotheses only examined the incremental variance explained by the personalized implicit measure, above and beyond that of the explicit job satisfaction measures. The traditional implicit measure was not included in initial analyses, as it was anticipated to share a large amount of variance with the personalized measure. However, in cases where the personalized measure did explain significant variance in the dependent variable, the analyses were conducted again including the traditional implicit measure as an independent variable to assess its explanatory value in the presence of the other implicit measure.
Results

Study 1

**Descriptive statistics.** Descriptive statistics were computed and examined before testing the hypotheses. Total scores for each of the variables were created as detailed in the method section. The data were assessed for outliers utilizing descriptive statistics, histograms and scatterplots. A single participant was removed from subsequent analyses, as the data provided was three standard deviations from the mean. Although additional data points may have been considered as outliers, a conservative approach was used, only eliminating a single participant. In fact, the strength of key correlations were somewhat weakened by removing this participant; however, the data was a clear outlier as identified through several methods. Thus, subsequent analyses are based on the remaining 235 participants.

Table 1 presents the descriptive statistics for Study 1 variables. Most of the study variables, except for JSS, are slightly negatively skewed indicating that there are more positive than negative values in the distribution. The three explicit job satisfaction measures (JSS, OJS, & MSQ) have positive kurtosis values, or leptokurtic distributions, indicating that many of the values are concentrated around the mean. Conversely, the three implicit measures (IAT, P-IAT, & Christianity IAT) as well as the explicit Christianity measure all have negative kurtosis values, or platykurtic distributions, where the values are spread out across the range, resulting in a flatter curve in a graphical representation of the distribution. However, neither of these statistics for any of the variables is extreme, so the distributions are generally within normal ranges.

**Order effects.** The three implicit measures were presented in a counterbalanced fashion. ANOVAs for condition on each of the dependent variables were conducted to ascertain if order had any significant affect (Table 2). Condition was not significant for any of the dependent
variables; thus, all conditions were combined for further analyses.

**Test of Hypotheses 1 and 2.** In order to examine H1 and H2, correlations between the variables of interest were examined (see Table 3) to provide preliminary evidence as commonly used in traditional MTMM analyses. Monotrait, monomethod correlations should be the highest, followed by monotrait, heteromethod, and finally heterotrait, monomethod correlations are anticipated to be the smallest. The three explicit job satisfaction variables (monotrait, monomethod) were in fact the largest, all close to or above the guideline for large effect sizes, \( r^2 = .50 \) (Cohen, 1992), where \( r^2 = .45 \) (OJS & JSS), \( .55 \) (MSQ & OJS), and \( .62 \) (MSQ & JSS). The monotrait, heteromethod relationship effect sizes were all below the .10 small effect size guideline. The highest was for explicit and implicit Christianity, \( r^2 = .06 \). The effect sizes for the relationships between the two implicit job satisfaction measures with each of the three explicit job satisfaction measures were all nonsignificant except for the non-personalized IAT with OJS; however, the effect size was extremely small, \( r^2 = .02 \). There were some significant relationships for the heterotrait, monomethod correlations; however, even the largest of these correlations (implicit Christianity and personalized implicit job satisfaction) was still small (\( r^2 = .11 \)) which may represent the common measurement method.

The relationship between the two implicit job satisfaction measures was positive and significant as anticipated, \( r = .18, p < .01 \); however, a stronger relationship was expected considering they are measuring the same trait with slightly different methods, as well as using the same stimuli. Thus, it conveys the impact of the small but significant changes to measurement method and the impact it had, with the personalized and non-personalized job satisfaction IATs having only a small relationship, indicating that they may capture different information.
The implicit and explicit Christianity measures were significantly related ($r = .25, p < .01$) as anticipated; however, implicit Christianity was also significantly related to both of the other implicit job satisfaction measures ($r = .23, p < .01$ with IAT and $r = .33, p < .01$ with P-IAT), with even stronger relationships than between the two implicit job satisfaction measures, which was not anticipated. The explicit Christianity measure was also significantly positively related to JSS, which was also not predicted. In examining the distributions of these variables, both Christianity variables had the highest kurtosis values, suggesting platykurtic, wider distributions than the other variables. Thus, the wider distribution of scores may be picking on relationships with other variables that were not anticipated.

Some initial construct validity evidence is provided by these metrics. Convergent validity evidence of the three explicit job satisfaction measures is evidenced by their strong, positive correlations. Similarly, the two Christianity measures were positively related, as expected. The two implicit job satisfaction measures were significantly, positively related; however, this correlation was not large. As anticipated, these results provide both convergent and discriminant validity, with small but significant relationships. However, it was anticipated that the two implicit measures of job satisfaction would have a stronger relationship together than with the other implicit measure of Christianity, as monotrait heteromethod correlations ought to be larger than heterotrait monomethod correlations, but this was not the case.

Given that the relationships between the variables are not cleanly adhering to the predicted MTMM predictions, there is some concern in terms of the factor structure of these measures for subsequent analyses. The three job satisfaction measures are strongly related, so they may form a factor. However, both Christianity variables have displayed unanticipated relationships with other study variables; thus, they may not clearly form a trait factor in the
factor analyses as predicted.

Model 1 (see Table 4) proposed two latent factors based on method, implicit and explicit, would explain the observed variables. Model 1 had mixed results: the CFI and GFI indicators suggested good model fit, although the other indices suggested moderate fit, with values on the borderline of suggested guidelines. The RMSEA value suggested mediocre fit and the lower bound of the 90% confidence interval was close to zero, but did not include it. The chi-squared value was significant and larger than the degrees of freedom. Thus, overall the model has mediocre fit and some adjustments are warranted. In looking at suggestions to improve model fit, the largest residuals are for explicit Christianity and implicit Christianity. Moreover, the modification indices suggest that adding error covariance between explicit Christianity and both the personalized IAT and implicit Christianity would improve model fit. Thus, as seen with the correlations above, it appears that Christianity impacted model fit.

The next step was to test Model 2, which proposed an additional two latent factors to explain the observed data: Job Satisfaction and Christianity. However, the analyses would not run this model as it is oversaturated, where the number of parameters was in excess in relation to the number of observed variables. Models 3 and 4 are increasingly complex, adding additional latent variables, and thus would not run either. Model 5 was more simplified, examining only the two implicit job satisfaction measures, proposing a latent factor for each: personalized and non-personalized. However, there were not sufficient degrees of freedom to run the analysis given that the IAT produces single scores and multiple observations are required for this type of analysis. Although it is not the ideal analysis for IAT scores, an attempt was made to parcel the IAT scores to create multiple observation scores in order to run the analyses. However, the resulting scores were not interpretable. In order to better understand relationships between the
variables, subsets of the model were examined separately.

When examining Model 2, the results provided preliminary information to identify the source of the problem, even though the model would not run. The most extreme standardized residuals (both positive and negative) are for explicit Christianity with both implicit job satisfaction measures, suggesting that again, explicit Christianity may be problematic in the model fit analyses and are not relating to other variables as predicted. Thus, several subsets of the initially proposed models were examined to better understand the relationships between study variables.

Model 6 examined implicit and explicit job satisfaction alone, not including Christianity. As displayed in Table 4, Model 6 displayed excellent model fit with all of the goodness-of-fit indicators well within the suggested guidelines for strong model fit. In Figure 6, it is shown that the three explicit job satisfaction measures load onto the explicit latent factor and the two implicit job satisfaction measures load onto an implicit latent factor. However, the personalized job satisfaction measure displays the weakest relationship and the highest error variance. This suggests that it may be an area to look into with future analyses and may not be as strongly related to the other variables as predicted.

Thus, in examining H1 (a four factor model where the implicit and explicit constructs are related but distinct), given that the four factor model could not be executed, it could not be the best fit for the data. Thus, H1 was not supported. However, the goal of Study 1 was to provide initial construct validity evidence for the new measure of job satisfaction. There were some preliminary findings that did provide limited initial validity evidence. The correlations between the personalized IAT and each of the explicit job satisfaction measures were in the positive direction, although not significant, and the correlations with the other two implicit measures
were positive and significant. The relationship between the two implicit job satisfaction measures was positive and significant, as anticipated; however, given these are monotrait correlations with similar methodology, we might expect stronger correlations. However, the small correlation, as well as other statistical evidence in the descriptive statistics and relationships with other variables, indicates that these measures are clearly unique. In previous research, personalized and non-personalized implicit measures have been moderately correlated (e.g., $r = .37, p < .01$; Olson & Fazio, 2003).

**Study 2**

**Descriptive statistics.** Descriptive statistics were computed for all Study 2 variables and examined before testing the hypotheses. Total scores for each of the variables were created as detailed in the method section. The data were assessed for outliers utilizing descriptive statistics, histograms, scatterplots and contextual understanding of values. Several values were provided that were more than three standard deviations from the mean, which is one method of identifying outliers. Looking at the values in the context of possible floor and ceiling effects, the pattern of responding for the participant, and considering the scale, the decision was made to include most values in the overall analysis. For example, some lateness or absence ratings were more than three standard deviations from the mean; however, we would not expect a normal distribution on these variables. As long as the value appeared reasonable (e.g., frequency of absence in one month necessarily is less than 31), a conservative approach was used and values were retained. According to these guidelines, there was only a single participant removed subsequent analyses, which are based on the remaining 123 participants.

Table 5 presents the descriptive statistics for Study 2 variables. Most of attitudinal measures have smaller skewness and kurtosis values, indicating bell-curved distributions. In
comparing the two IATs from Study 1 and 2, it appears that the IATs in Study 2 have more variability than Study 1, with slightly larger standard deviations, larger skewness and kurtosis values. There are almost twice as many subjects in Study 1 than Study 2, which may account for some of the variability being leveled out to some degree. The P-IAT in Study 2 had slightly more negative values than Study 1, with a lower mean and positive skewness value; however, these values and comparisons are still within a small range.

For the behavioral measures, such as CWB, absence, and lateness, the skewness and kurtosis values were much more extreme, which is reasonable given one would not expect a normal distribution of these values. For example, lateness and absence had the largest positive skewness and kurtosis values indicating that there are many more low values in the distribution and these are highly concentrated around the mean.

**Order effects.** The two implicit measures were presented in a counterbalanced fashion. Table 6 presents the results of ANOVAs for condition on each of the dependent variables. The order of presentation of the two implicit job satisfaction measures (personalized & non-personalized) did not have a significant effect on the dependent measures, except for two of the turnover intention measures: TI1, $F(2,121) = 4.89, p < .05$, $\eta^2 = .04$, and TI3, $F(2,121) = 5.30, p < .05$, $\eta^2 = .04$. Both measures assess how likely the participant is to stay in their current position for the next two years (TI1) or for what length of time (TI3). In both measures, participants who completed the non-personalized job satisfaction IAT (IAT) before the personalized IAT (P-IAT), on average were more likely to stay in their current position. However, given that the effect size for these measures was only around 2% to 3%, it was determined that this was not of practical significance and subsequent analyses were based on the combined data from both conditions.
A potential concern was participant fatigue; thus the OCB-A, OCB-GC, and CWB measures, which were administered twice (self-referent vs. “other perspective”) with minor wording changes, were compared. There were no significant differences in the OCB-A and OCB-AO measures, $t(121) = 1.91, p > .05$, or for OCB-GC and OCB-GCO, $t(120) = 1.48, p > .05$. The difference between CWB ($M=28.5, SD=12.1$) and CWB-O ($M=26.7, SD=13.7$) was significant, $t(120) = 2.21, p < .05$; however, the CWB items are more internal (e.g., daydreaming or doing a behavior on purpose) than the OCB items which are more visible to others (e.g., helping others, punctuality). Thus, it is reasonable to observe more significant differences between these measures. Furthermore, if participant fatigue was the explanation for these differences, significant differences should be present across all three measures, which was not the case. Therefore, these variables were not adjusted or standardized before including them in analyses.

**Test of Hypothesis 3a and 3b.** Hypotheses 3a and 3b predicted that affective commitment would be positively related to the implicit and explicit job satisfaction measures (3a) and more strongly related to the P-IAT than IAT (3b). Affective commitment was significantly related to the three explicit measures of job satisfaction (JSS), $r = .60, p < .01$, (OJS), $r = .54, p < .01$, and (MSQ), $r = .48, p < .01$; however, it was not related to either of the implicit measures, (IAT), $r = .11, p > .05$ or (P-IAT), $r = .06, p > .05$. Thus, partial support was found for H3a, but H3b was not supported.

**Test of Hypothesis 4a and 4b.** Hypotheses 4a and 4b predicted that job involvement would be positively related to the implicit and explicit job satisfaction measures (4a) and more strongly related to the P-IAT than IAT (4b). Job involvement was significantly related to the three explicit measures of job satisfaction (JSS), $r = .61, p < .01$, (OJS), $r = .65, p < .01$, and
(MSQ), \( r = .58, p < .01 \), and the non-personalized IAT (IAT), \( r = .29, p < .05 \). Job involvement was not related to the personalized (P-IAT), \( r = .08, p > .05 \). Therefore, H4a was partially supported but H4b was not supported.

Test of Hypothesis 5a and 5b. Hypotheses 5a and 5b predicted that reported organizational citizenship behaviors would be positively related to the implicit and explicit job satisfaction measures (5a) and more strongly related to the P-IAT than IAT (5b). Two subscales of OCBs were measured, altruism (OCB-A) and generalized compliance (OCB-GC), and the analyses were calculated for each dimension. OCB-A was significantly related to the three explicit measures of job satisfaction (JSS), \( r = .29, p < .01 \), (OJS), \( r = .26, p < .01 \), and (MSQ), \( r = .29, p < .01 \); however, it was not related to either of the implicit measures, (IAT), \( r = .17, p > .05 \) or (P-IAT), \( r = .02, p > .05 \). Similarly, OCB-GC was significantly related to the three explicit measures of job satisfaction (JSS), \( r = .24, p < .01 \), (OJS), \( r = .20, p < .05 \), and (MSQ), \( r = .19, p < .05 \), as well as to the non-personalized implicit measure (IAT), \( r = .21, p < .05 \), but not related to the personalized IAT (P-IAT), \( r = .00, p > .05 \). Thus, partial support was found for H5a but H5b was not supported.

Test of Hypothesis 6a and 6b. Hypotheses 6a and 6b predicted that counterproductive work behaviors (CWBs) would be negatively related to the implicit and explicit job satisfaction measures (6a) and more strongly related to the P-IAT than IAT (6b). CWBs were significantly related to the three explicit measures of job satisfaction (JSS), \( r = -.40, p < .01 \), (OJS), \( r = -.41, p < .01 \), and (MSQ), \( r = -.38, p < .01 \), and the non-personalized IAT (IAT), \( r = -.27, p < .01 \). CWBs were not related to the personalized (P-IAT), \( r = .05, p > .05 \). Therefore, H6a was partially supported but H6b was not supported.

Test of Hypothesis 7a and 7b. Hypotheses 7a and 7b predicted that absence would be
negatively related to the implicit and explicit job satisfaction measures (7a) and more strongly related to the P-IAT than IAT (7b). Several forms of absence were investigated: days absent in the last three months (ABS), of those days the number that was voluntary (ABS-VOL), the same number calculated as a percent (voluntary/total absences; ABS-PER), number of excused absences in the last year (e.g., was truly sick; ABS-EXC), and the number of unexcused absences in the last year (e.g., taking a personal day; ABS-UNEXC). As displayed in Table 7, ABS, ABS-EXC, and ABS-UNEXC were not significantly correlated with any of the five job satisfaction measures, implicit or explicit. For the two voluntary measures of absence, which are different calculations of the same information, the only significant correlations were found for the personalized implicit measure: ABS-VOL (P-IAT), $r = -.20, p < .05$ and ABS-PER (P-IAT), $r = -.28, p < .01$. Higher scores of implicit job satisfaction were related to lower voluntary absences. Thus, both H7a and b were partially supported.

**Test of Hypothesis 8a and 8b.** Hypotheses 8a and 8b predicted that lateness would be negatively related to the implicit and explicit job satisfaction measures (8a) and more strongly related to the P-IAT than IAT (8b). Several forms of lateness were investigated: number of times more than 10 minutes late in the last month (LATE1) and the last 6 months (LATE6), the average number of minutes late (LATE-M), and the most common reason for being late. As displayed in Table 7, none of the lateness variables (LATE1, LATE6, LATE-M) were significantly correlated with any of the five job satisfaction measures, implicit or explicit. Thus, H8a and b were not supported. Of the 121 participants that provided reasons for being late, the most common reason was transportation delays (66.9%), followed by overslept or lack of sleep (10.7%), didn’t feel like rushing (5.8%), weather (3.3%), co-workers are often late/boss doesn’t care (3.3%) childcare issues (1.7%), and other (8.3%).
Test of Hypothesis 9a and 9b. Hypotheses 9a and 9b predicted that turnover intention would be negatively related to the implicit and explicit job satisfaction measures (9a) and more strongly related to the P-IAT than IAT (9b). Specifically, higher levels of satisfaction would be related to lower levels of intention to leave (negative relationship). Several forms of turnover intention were investigated: the six-item scale by Bothma and Roodt (2013; TIS-6), three items from Siers and Peters (2011; TI-SP), and three single turnover intention items, “How likely are you to stay in your current job for the next two years?” (TI1), “It would take a lot to get me to leave my current employer” (TI2), and “How long do you anticipate staying in your current job?” (TI3). Given the phrasing of these measures, a negative relationship is expected with TIS-6 and TI-SP, but a positive relationship with the other measures. TIS-6 was negatively related to the explicit job satisfaction measures as anticipated given the phrasing of the items, (JSS), \( r = -0.68, p < .01 \), (OJS), \( r = -0.63, p < .01 \), and (MSQ), \( r = -0.57, p < .01 \); however, it was not related to either of the implicit measures, (IAT), \( r = -0.14, p > .05 \) or (P-IAT), \( r = 0.06, p > .05 \). TI-SP was negatively related to the explicit job satisfaction measures as anticipated, (JSS), \( r = -0.60, p < .01 \), (OJS), \( r = -0.57, p < .01 \), and (MSQ), \( r = -0.50, p < .01 \). The relationship between the TI-SP and the non-personalized IAT (IAT) was slightly above the threshold for statistical significance, \( r = -0.17, p = .057 \) but was not related to the personalized measure (P-IAT), \( r = 0.07, p > .05 \). All three turnover intention measures were related to each of the three explicit job satisfaction measures in the direction anticipated, but not to either of the implicit measures: TI1 (JSS), \( r = 0.42, p < .01 \), (OJS), \( r = 0.33, p < .01 \), (MSQ), \( r = 0.41, p < .01 \), (IAT), \( r = 0.11, p > .05 \), and (P-IAT), \( r = 0.06, p > .05 \); TI2 (JSS), \( r = 0.45, p < .01 \), (OJS), \( r = 0.36, p < .01 \), (MSQ), \( r = 0.47, p < .01 \), (IAT), \( r = 0.06, p > .05 \) and (P-IAT), \( r = 0.06, p > .05 \); and TI3 (JSS), \( r = 0.27, p < .01 \), (OJS), \( r = 0.24, p < .01 \), (MSQ), \( r = 0.22, p < .05 \), (IAT), \( r = -0.04, p > .05 \), and (P-IAT), \( r = -0.05, p > .05 \). Thus,
considering all of the turnover measures, H9a was partially supported, displaying significant relationships between turnover and explicit job satisfaction, but not with implicit job satisfaction; however, H9b was not supported.

**Test of Hypothesis 10a-e.** H10a-e predicted that the implicit measure of job satisfaction would predict incremental variance beyond explicit job satisfaction in OCB (H10a), CWB (H10b), absence (H10c), lateness (H10d), and turnover intentions (H10e). These hypotheses were examined with hierarchical regression and relative weights analysis. Table 8 displays the results of the hierarchical regression analyses. The only two outcome measures for which the P-IAT explained significant additional variance, above and beyond the three explicit job satisfaction measures, was for voluntary absence and lateness – one month (Late-1M). For these variables, an additional regression model was examined (Model 3), including the traditional IAT to determine if the P-IAT provided additional variance explained above and beyond the traditional measure.

For voluntary absence (H10c), the P-IAT explained significant variance above and beyond the explicit job satisfaction measures, as well as the traditional implicit measure of job satisfaction. However, this was only one of several absence measures that was examined. Thus, partial support was provided for H10c.

For Late-1M (H10d), the P-IAT explained significant variance above and beyond the explicit measures, but when the traditional IAT was added into the analyses, neither of the implicit measures provided significant explanatory power in the regression model being examined. Thus, the P-IAT does provide additional explanatory power that is informative, but not when combined with the IAT as hypothesized.

The full set of hypotheses was also examined with RWA, for which the results are listed
In four of the outcome variables examined, the P-IAT provided the largest percentage of variance explained when examined with the three explicit measures of job satisfaction: voluntary absence, absence unexcused, Late-1M, and Late-6M. In each of these cases, the traditional IAT was then added to the analysis as well. For voluntary absence, absence unexcused, and Late-1M, the P-IAT still explained the largest amount of variance, despite adding the IAT. For Late-6M, both of the implicit measures shared the largest portion of variance explained, but the IAT explained more than P-IAT. It should be noted that in all four outcome variables, the overall variance accounted for by these models is quite small; however, depending on the context and scale, explaining even small variance can be impactful.

Thus, overall these sets of hypotheses had limited partial support. No support was found for OCB (H10a), CWB (H10b), or turnover intentions (H10e), but partial support was found for absence (H10c) and lateness (H10d).

**Exploratory Analyses.** As discussed earlier, this paper explored the effects of assessing a more psychological distant construct by asking the participant how others at work might rate himself or herself (“other perspective” items). These three exploratory measures were proposed as an attempt to enhance the relationships with implicit measures, where the relationship between implicit measures and “other perspective” items may be stronger than with self-referent items. Thus for each of the three exploratory measures (OCB-A, OCB-GC, and CWB) the self-referent items were compared with the other-referent items in their relationships with each of the five job satisfaction measures.

For OCB-Altruism, the OCBA-Other (OCBA-O) measure produced similar correlations as OBCA (self as referent) for four of the five job satisfaction measures. However for the non-personalized IAT, the correlation with OCBA-O, \( r = .22, p < .05 \), was stronger than with OCBA
$r = .17, p > .05$, which was not significant. Thus, higher implicit job satisfaction was positively related to how someone believes others at work would rate their altruistic behaviors. For OCB-Generalized Compliance, OCBGC-Other was not significant in any of relationships with the five job satisfaction measures. For the final “other perspective” measure, CWB-Other, again the relationship with the non-personalized IAT was larger for CWB-O, $r = - .32, p < .01$, than with CWB (self as referent) $r = -.27, p < .01$. Thus, higher ratings of implicit job satisfaction were related to lower CWB ratings when taking the perspective of others, more than when reporting CWBs about oneself. For the remaining four job satisfaction measures, the CWB-O measure provided smaller or not significant relationships as compared to the CWB measure. Overall, although no significant positive improvements were observed with the personalized IAT, the relationship with the non-personalized IAT was strengthened in two out of three cases by changing the referent in using “other perspective” items.

**Exploratory Moderator Analyses.** In order to better understand the differential results between Study 1 and Study 2, potential moderators were explored post-hoc. In Study 2, the IAT was significantly related to all three EJS measures. In Study 1, the IAT was related to one out of the three EJS measures. To further explore these differences, several of the demographic variables were examined to determine if there were significant differences between the two samples. For categorical variables, chi-squared tests were conducted; however, none were significant. For continuous variables, ANOVAs were conducted. The only significant result was for the variable: years of experience (Experience), $F(1, 351) = 5.13, p = .03$, which was greater in Study 1 ($M = 4.91, SD = 3.86$) than in Study 2 ($M = 4.05, SD = 2.63$). Thus, Experience was further explored as a moderator that could potentially explain the difference between the findings of these two studies.
In order to assess the influence of Experience across both studies, the samples were combined and examined as a whole. Before conducting a regression analysis, all relevant variables were standardized and centered, and interaction terms were created. In the first step of the regression equation, the independent variables, explicit job satisfaction and Experience, were entered separately and the dependent variable, the IAT, was regressed onto them. In the second step, an interaction term (EJS x Experience), created by multiplying the independent variable, EJS, and the moderator variable, Experience, was entered and the dependent variable was regressed onto the moderator variable. This was repeated for each of the three EJS measures (Table 10). Experience was found to be a significant moderator for each of the EJS measures, in a very similar pattern (see Figure 7 for a sample graphical description). Participants with low Experience had a positive relationship between the IAT and EJS; however, this relationship was not the same for those with more Experience. Instead, high Experience participants did not have a significant relationship between the IAT and EJS (Table 11).

To further understand the effect of Experience on this relationship, two other demographic variables of age and months in current role (Months) were examined, as they are related to experience (Table 12) and may serve as proxy variables. For the variable of age, one single outlier was identified by visual inspection of a scatterplot and the data provided was three standard deviations from the mean. This individual was removed from subsequent analyses and the remaining 345 participants were used. Regressions for each of these variables (Age and Months) were conducted by repeating the process used for Experience above. A similar relationship was displayed for each of the three EJS measures (Figure 8), where for younger participants, there was a significant positive relationship between the IAT and EJS; however, there was no such relationship amongst older participants (Table 13). Similarly, for participants
who reported shorter tenure (Months), there was a positive relationship between the IAT and two of the three EJS measures (JSS, MSQ; Figure 9). No such relationship was found amongst participants who reported longer tenure (Table 16).
Discussion

Implicit attitude measurement has experienced increasing popularity in social sciences research over the last few decades; however, its application to the organizational domain has been more limited (e.g., Uhlmann, Leavitt et al., 2012). Additional modifications have been suggested to further improve the ability of these implicit measures to predict certain behaviors. One such modification that was explored in this paper is the personalization of the implicit measure to more specifically assess the respondent’s own attitude and exclude their general knowledge of the construct. The current study built upon previous work (Boyd, 2010) by enhancing an implicit measure within the domain of job satisfaction and creating a personalized version of this measure. Study 1 examined the construct validity evidence for these new measures and Study 2 sought to replicate these results with a separate sample and examine criterion-related validity evidence with organizationally-relevant attitudes and behaviors. The following sections will address a summary and interpretation of the results across both studies collectively, and then examine individual study results, followed by theoretical and methodological contributions, limitations, and the conclusion.

Implicit and Explicit Job Satisfaction Relationships Across Study 1 and Study 2

Before examining the individual hypotheses proposed in each of the studies, the relationships across Studies 1 and 2, between the implicit job satisfaction measures, traditional (IAT) and personalized (P-IAT), with the explicit job satisfaction (EJS) measures will be reviewed. Given that the results across these studies are critical to the understanding of the initial construct validity evidence of the implicit job satisfaction measures, it is important to review these results collectively, and not in isolation.

One of the main goals of this paper was to provide initial validity evidence for the P-IAT;
however, the P-IAT was not found to be significantly related to any of the EJS measures, in either Study 1 or 2. There are several potential reasons for the lack of significant findings, which will be discussed at length in the limitations section. First, the idea of personalizing implicit measures is new, with limited research; thus, the most effective method has not yet been established. Nosek (2008b) claimed there were several issues with the personalization approach proposed by Olson and Fazio (2004); however, the concept of personalization is still a worthy one and in need of additional research (Uhlmann, Leavitt et al., 2012). Second, selection of stimuli is a critical to the success of an implicit measure. It is possible that the stimuli selected did not feel relevant for the participants. However, given the success of the IAT in Study 2, this limitation does not appear to be fully applicable. Third, the construct of job satisfaction is complex and type of construct has been shown to be a moderator of implicit-explicit relationships (Nosek, 2005); thus, other moderators may impact these relationships. Finally, there may be something unique to the sample of participants used in this study. The prerequisite of holding a customer service job may have served to create an overly homogeneous sample and thereby restricting the range on the focal variables.

A secondary goal was to enhance an existing implicit measure of job satisfaction from Boyd (2010), by modifying the stimulus words to be more relevant to a more narrow population of customer service workers. This traditional implicit measure of job satisfaction (IAT) was significantly related to all three EJS measures in Study 2 and to a greater magnitude than in previous research with this specific measure (e.g., Boyd, 2010). These results alone would suggest that this newly revised measure is a better measure of job satisfaction than Boyd (2010), given the increased convergent validity evidence in this study. However, these results were not replicated in Study 1 of this paper. In fact, the IAT was only significantly related to one of the
EJS measures in Study 1, and it was of a magnitude similar to previous research (Boyd, 2010).

The inconsistencies between the results in Study 1 and Study 2 warrant further exploration. Although the EJS measures were stable across the studies, the implicit measures were not. The IAT was more strongly related to the EJS measures in Study 2, yet the sample size is almost half that of Study 1. Weak correlations can sometimes be related to lack of power, but the relationship was reversed, where more significant findings were present in the smaller sample. The standard deviations for both the IAT and P-IAT were larger in Study 2 than Study 1, indicating more variability, which may have accounted for the significant findings. The direction of the means across the studies was inconsistent, with the mean of the IAT increasing from Study 1 to Study 2, whereas the mean decreased for the P-IAT. The relationship between the IAT and P-IAT was $r = .18$ (Study 1) and $r = .21$ (Study 2), suggesting that these measures have some convergent validity, however they are also quite different, demonstrating discriminant validity. The strength of these correlations is similar to that of the IAT and EJS measures. It was initially anticipated that the IAT and P-IAT would be more strongly related.

Overall, these results suggest an instability in the implicit measures which makes it difficult to recommend their further use in research in their current state. A concern about implicit measures that has been raised in previous literature is their stability (Nosek, Greenwald, & Banaji (2007); however, Nosek, et al., as well as others, have reviewed a substantial amount of reliability evidence (internal consistency, test-retest reliability) that has warranted their continued use. Although best practices for implicit measurement have been followed in the current work and acceptable levels of internal consistency in the implicit measures were demonstrated, there were some inconsistencies across the two samples that allowed the IAT to function differently.

Thus, post-hoc analyses were conducted to explore potential moderating effects between
these two studies. When examining demographic variables as potential moderators between the two studies, the only variable that demonstrated significant differences was years of experience (Experience). Examining both samples together, Experience was found to moderate the implicit-explicit job satisfaction relationship. Participants with less Experience had a significant positive relationship between implicit and explicit job satisfaction; whereas, participants with more Experience, did not have any significant relationship between these variables. When examining the implicit-explicit job satisfaction correlations amongst only 25% of the sample with least experience, these correlations increased in magnitude, from $r = .25, .29, & .30$ to $r = .35, .36, & .41$. These values are within closer proximity to that of previous related research of implicit-explicit job satisfaction correlations ($r = .28$, Siers & Peters, 2011; $r = .36$, $r = .38$; Sumner & Haines, 2004). Thus, a concern with previous research, and a suggestion for future research, is range on this variable within a sample, to understand the potential effects of variability of Experience on implicit-explicit relationships. To further understand why Experience demonstrated this effect, related variables of age and tenure (measured in Months in current role) were examined as moderators as well. These are frequently examined demographic variables in relationships with job satisfaction (e.g., Riza, Ganzach, & Liu, 2016) and may serve as proxy variables for experience.

Both age and tenure were found to be significant moderators of the implicit-explicit job satisfaction relationship. In a similar pattern to Experience, participants who were younger or had less tenure in their current roles had a significant positive relationship between the IAT and EJS measures. For age, relationships with all three EJS measures were significant. For tenure, relationships with two of the three EJS measures were significant. Participants who were older or had more tenure in their current roles, did not have significant relationships between the IAT
and EJS measures. Further discussion of these relationships and additional potential reasons for the differences between Study 1 and Study 2 are explored in later sections of this paper.

**Study 1**

The goal of Study 1 was to provide initial construct validity evidence for the two implicit measures via MTMM and CFA analyses. The MTMM analyses yielded some basic support of the anticipated strength of correlations of some measures; however, the most critical relationships to this study (those involving the two implicit measures) were mostly not significant. Due to the nature of the data, not all of the proposed SEM models were able to be executed. The CFA analyses did support a general structure of implicit and explicit measures existing as separate latent factors, providing basic validity evidence of discriminant and convergent validity. One finding that was demonstrated by the SEM models and MTMM correlations is that the Christianity measure did not relate to the job satisfaction measures as anticipated, and it had the least fit within the model examining all of the variables. In some cases, Christianity was significantly related to job satisfaction measures which were not predicted, as there is not a theoretical connection. A potential explanation for these possibly spurious relationships is wide range on the distributions of these variables, with high levels of kurtosis and variability. The composition of the sample, which is highly secular and a large percentage of non-Christians, may have influenced these results. Participants may have viewed the religious measures as lacking in relevance, which may have had unintended influence on subsequent measures. This could be a potential reason that the results from the IAT were so different in Study 1 vs. Study 2.

**Study 2**

Study 2 sought to replicate the relationships between implicit and explicit measures in
Study 1, as well as extend the examination of relationships with attitudinal and behavioral measures. The IAT was significantly related to each of the EJS measures, and these relationships were stronger than in previous research with this measure (Boyd, 2010); however, the P-IAT was not significantly related to any of the EJS measures. Again, the results of the significant relationships between the IAT and EJS measures in this study alone would be encouraging of drawing conclusions about the improvement and importance of the revised IAT; however, in conjunction with Study 1 results, it is more difficult to make those recommendations with confidence without considering the nature of moderators.

**Attitudinal measures.** Study 2 examined the relationship between job satisfaction and two attitudinal variables: affective commitment and job involvement. The P-IAT was not significantly related to either of these attitudinal variables. The IAT was significantly related to job involvement, such that higher levels of job involvement were associated with higher levels of implicit job satisfaction. The relationship was stronger in the current study, $r = .28$, than past research (Boyd, 2010), $r = .15$, suggesting an improvement of the IAT. In some cases (for these attitudinal variables and the behavioral measures addressed below), there was partial support of hypotheses because the attitudinal variables were related to the EJS measures, yet there was not a relationship with the implicit measures.

**Behavioral measures.** Study 2 also examined measures of behavioral reports or behavioral intentions, given that actual behavioral observations could not be collected in the current study due to a cross-sectional design. The IAT was significantly related to organizational citizenship behavior (generalized compliance) and counterproductive work behaviors. Higher implicit job satisfaction was related to more OCBs and less CWBs. The OCB-GC was related to the IAT, $r = .20$, at a similar strength as it was related to the EJS measures, $r = .19$ to $r = .24$, and
within the range of previous meta-analytic findings with other EJS, $\rho = .28$ (Organ & Ryan, 1995). These findings along with the relationship with CWBs suggest some potential preliminary support of construct validity evidence for the revised implicit job satisfaction measure. However, these results should also be considered within the wider perspective of all the results in this study.

The findings for the relationships with the P-IAT were more limited. The only variable that P-IAT was significantly related to was the voluntary absence measure as predicted, $r = -.19$, with higher levels of job satisfaction related to lower levels of absence. The strength of this relationship is encouraging, in that it is close to the range found in meta-analyses of absence and EJS measures, of low to mid .20s (Johns, 1997).

Study 2 also examined a set of incremental variance predictions of the implicit measures across the set of behavioral variables using hierarchical regression and relative weights analysis. The P-IAT explained significant variance, above and beyond that of the EJS measures, in four of the behavioral variables: voluntary absence, excused absence, lateness (one month), and lateness (six months). The explained variance was still significant in the presence of the IAT, when added into the analyses, for voluntary absence and absence excused; however, not for lateness (one month) or lateness (six months). It should be noted that the percent of variance explained by the P-IAT in these variables was small, but as recent authors have noted (Greenwald, Banaji, & Nosek, 2015), small effects of implicit measurement can have a large impact depending on the setting, type and frequency of behavior. For example, explaining only 2% of the variance of a relationship in a typical research experiment may not be seen as impactful or practically significant. However, if it is a highly complex variable, such as job satisfaction, a behavior that is conducted repeatedly, or a high cost behavior, such as accident prevention, then explaining
even small portions of variance becomes impactful. In the current study, given the lack of basic validity evidence in earlier analyses and limited findings with the behavioral variables, the interpretations of these findings are constrained and tentative.

**Exploratory measures.** A final set of exploratory measures assessed the impact of changing the referent of some of the items from self to other. This was an attempt to increase the psychological distance of these constructs, as implicit measures have been shown to predict implicit behaviors especially well (e.g., Greenwald et al., 2009). Three sets of measures were examined from the “other perspective”: OCB-Generalized compliance, OCB-Altrusim, and CWB. Although the P-IAT was not significantly related to any of these three revised measures, the IAT was significantly related to two out of the three: OCB-A and CWB. In both cases, the strength of the relationship was increased in comparison to the relationship of the IAT with the self-referent items of these measures. Conceptually, the idea that the implicit measures would be more strongly related to more psychologically distant constructs, and that this can potentially be seen with simple manipulation of wording, is interesting. This effect would need further examination to explore the replicability and impact of these findings, but it is noteworthy given the exploratory nature of these analyses.

**Theoretical and Methodological Contributions**

Overall, given the inconsistencies and complexity of the results across both studies, the ability to make strong conclusions about the direct effects of implicit-explicit relationships is limited. However, in exploring moderators of this relationship, there is additional evidence to inform theoretical and methodological contributions, as well as areas of future research. Providing validity evidence for the two implicit measures was the main focus of this study. Due to the lack of correlations between P-IAT and any of the EJS measures, the theoretical
contributions are limited. Conceptually, the goal of combining personalization and single-target implicit measures is still worthy and was a unique contribution of this paper. The application to the organizational domain was also relatively unique, as there has been a call for more implicit research of work-related variables (e.g., Becker & Cropanzano, 2010; Scherbaum & Meade, 2013). The following addresses the findings of relationships with the traditional implicit measure, then the personalized implicit measure, followed by exploratory measures.

**Traditional implicit measure.** The strongest hypothesized findings across the studies were the magnitude of the correlations between the IAT and EJS measures in Study 2. Although these correlations are moderate ($r = .25$ to $r = .30$), they are much improved upon from previous use of a similar measure using different stimulus words ($r = .15$; Boyd, 2010) and in line with other related research of implicit-explicit job satisfaction correlations ($r = .28$, Siers & Peters, 2011; $r = .36$, $r = .38$; Sumner & Haines, 2004). A recent article by Greenwald et al. (2015) reviews the importance of even small IAT effects when considering the impact on the population. They review two meta-analyses of the relationships between the IAT and with explicit black-white attitude measures, finding the aggregate correlations were $\bar{r} = .15$ to $\bar{r} = .24$ depending on inclusion data. This area of research has demonstrated the most success with predictive validity and the article concludes that even small effects can have significant societal effects due to the vast application across individuals or the repeated nature of behavior. Similarly, the construct of job satisfaction is highly complex and explaining a small portion of the variance is valuable, given the potential impact across many variables, as well as the scale in a large organizational setting. In Study 2, the implicit-explicit correlations exceed that of the even the larger aggregate correlation reported in Greenwald et al. (2015). These findings alone are supportive of the traditional implicit measure of job satisfaction. However, due to the
inconsistencies between Study 1 and Study 2, the confidence with which conclusions can be
drawn about this IAT is limited.

Improvements to the job satisfaction IAT from Boyd (2010), such as limiting the
participant pool to a specific industry and using more job-relevant stimuli rather than using
general words related to work, appear to have increased the magnitude of the relationship with
explicit measures in Study 2. Thus, making the measures more specific and relevant to narrow
what is being measured (e.g., my job vs work) as was done in this study, may be a consideration
for future research recommendations.

In an attempt to better understand the inconsistencies in the correlations with the
traditional implicit measure across both studies, several moderators were explored. Years of
experience, age, and tenure were all found to moderate the implicit-explicit job satisfaction
relationship. These three variables are variants of time measurement. Participants with less time
on each of these measures (lower experience, lower tenure, and younger) were found to have
significant positive relationships between implicit and explicit job satisfaction; however, there
was no such relationship for participants with higher levels on these time measures (more
experience, more tenure, and older). In order to better understand the potential theoretical
contribution of these findings, related research was explored.

The relationship between age and job satisfaction has been frequently investigated over
time, resulting in a variety of reported relationships (positive linear, negative linear, u-shaped, no
relationship); however, the literature does not have a clear consensus on the true nature of the
relationship (e.g., Bernal, Snyder, & McDaniel, 1998). More recent research using a longitudinal
design provides further explanation of the complexities of this relationship. Riza, et al. (2016)
found that both tenure and age have indirect positive effects on job satisfaction by increasing
pay, and subsequently increasing job satisfaction. However, the direct effects are differential, with age increasing job satisfaction and tenure decreasing job satisfaction. Digging further into the data, they found that increased tenure in a role leads to decreased job satisfaction but that when an individual switches jobs, there is a boost in satisfaction. In the current study, the focus was on attempting to explain the implicit-explicit correlations rather than the effects of demographic variables on explicit job satisfaction. However, these new longitudinal research findings highlight the complexity of these relationships and demonstrate that searching for a simple linear relationship may obscure the true nature of the variables.

Job satisfaction as a construct is complex, as it has been investigated for so many decades in relation to a variety of variables; however, in many cases relationships are still unclear (e.g., Fisher, 2003). One aspect that may be affecting the results of the implicit-explicit relationships is the degree to which the construct is strong and elaborated in one’s mind. Although research has generally found increased implicit-explicit relationships for constructs with strong and elaborated representations in memory (Nosek, 2005), the construct of job satisfaction may be operating differently. In the current research, those with more experience had less correspondence between implicit and explicit job satisfaction than those with less experience. It may be that as workers gain more experience, they find that what influences the attitude of job satisfaction becomes more complex. Younger, less experienced workers may have a more straightforward view of job satisfaction, thus the stronger implicit-explicit relationships. Therefore, expanding the variables that are measured within a study to explore other potential moderators may be beneficial in future research. For example, a variety of factors have been shown to be related to job satisfaction ranging from specific job-type within a customer service industry (e.g., Brown & Mitchell, 1993) to pay (e.g., Riza et al., 2016) to personality traits.
(Judge, Heller, & Mount, 2002).

**Personalized implicit measure.** In Study 2 there were also a few significant findings for the relationship between the P-IAT and behavioral variables (e.g., voluntary lateness and absence), assessed through hierarchical regression and relative weights analyses. One of the main benefits of using an implicit measure is the predictive ability of attitudinal and behavioral variables beyond that of explicit measures. These findings display value for the P-IAT, suggesting that it may explain a different area of related constructs that neither the IAT nor EJS measures were able to explain. However, two factors make the practical implications of these findings less impactful: inadequate basic validity evidence and lack of replication of previous research. First, the P-IAT did not demonstrate any significant relationships with existing explicit measures, so basic validity evidence that was sought was not established. Second, if these results were similar to previous research they would be more impactful. Boyd (2010) used a traditional IAT and found significant relationships with lateness and turnover intention. These relationships were not replicated with the improved IAT in the current research; instead, significant relationships were found with other variables (e.g., job involvement, CWB, etc.). Thus, the lack of consistency across studies makes it more difficult to support this new measure.

**Exploratory measures.** The findings from the exploratory analyses with more psychologically-distant constructs were encouraging. The relationships between the IAT and two behavioral variables were enhanced by changing the referent of the items to a more distant evaluator (other vs. self). Research has demonstrated that implicit measures are successful in predicting implicit behaviors (e.g., higher implicit racial bias was related to degree of friendliness and social interaction, including sitting at a farther distance from researcher of that race; McConnell & Leibold, 2001). Future research should explore the replicability of this
effect. If a simple reframing of explicit items could measure a construct in a more psychologically-distant manner, there would be value in understanding the applicability of this approach.

**Limitations**

Several limitations of the current research are considered, to further understand the context of the findings, as well as potential explanations for the inconsistent results across the two studies. The first area addressed here is the lack of significant relationships with the personalized implicit measure of job satisfaction, which was the focus of this paper.

An aspect of the methodology that has been addressed in previous research and demonstrated to be a critical factor is selection of stimuli (e.g., Nosek et al., 2007). The stimuli for the IAT in the current study were intended to improve upon previous related research (Boyd, 2010). An attempt was made to ensure the stimuli were relevant for the specific job that the participant held, which is why the selection pool was limited to those with customer service jobs. Although the P-IAT did not correlate with any of the EJS measures in either study, potentially suggesting that the stimuli may not have been relevant, four out of the six correlations between the EJS measures and IAT (which used the same stimuli) were significant. If the stimuli were not relevant or critically flawed, it would not be expected to find any significant correlations. Again, the inconsistent results across the two studies and both implicit measures make it difficult to draw definitive conclusions in either direction.

A second type of limitation to be considered is the composition of the sample. In an attempt to improve the traditional IAT from previous research (Boyd, 2010), the sample was limited to those currently holding customer service jobs. By limiting the population, it is possible a sampling artifact was created and the sample was too homogeneous as a result.
However, when examining the demographic variables, there was appropriate variability, thus there is no evidence to suspect that homogeneity was a clear concern, however it could have been.

A third possible limitation in this study was the inclusion of the Christianity measures which were incorporated into Study 1 as measures of discriminant validity. These particular measures were selected as they were used in prior single-target IAT research (Wigboldus et al., 2004). However, these measures did not perform as anticipated, exhibiting stronger than expected correlations with some of the job satisfaction measures and demonstrating lack of model fit when entered into the CFA analyses. It is possible that these measures displayed unanticipated results due to the composition of the sample. The sample in this study is mostly secular and non-Christian; thus, the Christianity measures may have been seen as irrelevant or distracting. There may even be a possibility that the inclusion of these measures modified responses to the other study measures, such as the IATs, which could have contributed to the difference in the results from Study 1 and Study 2. During the data collection trials, there were questions from some participants regarding the relevance of religion to the task as documented in consent forms. Also, the priming task included in this study related to one’s job, in preparation for the job satisfaction surveys, although there was no priming measure for Christianity. These differences in the methodology between the two studies could have had unanticipated effects as well.

Finally, several other common statistical limitations are considered to determine if it is likely that any of these had an effect on the current sample. Insufficient sample size to determine significant effects is a common issue in research. However, given that small relationships were predicted for some of the study variables, a power analysis was conducted to ensure sufficient
power. The recommended sample size was met in both studies, thus sample size should not be
an issue. However, particularly with CFA analyses, required sample size is only an estimate, 
thus insufficient power may have been a concern in the current study. Another common 
limitation is restriction of range. However, in both studies, the range on all variables was 
reasonable and in line with previous research (Boyd, 2010). For variables in which we would 
not anticipate a normal distribution (e.g., absence and lateness), the range was still reasonable 
and there were participants represented at both ends of the continuum. Although the range on 
the P-IAT varied between Study 1 and 2, it was similar in size across both studies and in 
comparison to the IAT as well. A final statistical limitation that was relevant for the current 
study was the nature of the data and the resulting difficulty in running the proposed CFA 
analyses. The IAT provides single observation scores, but the CFA analyses require at least two 
observations per latent factor. An attempt was made to partition the IAT score into two parcels, 
although this is not the ideal treatment of the data; however, it did not work, instead producing 
some values that were uninterpretable. Thus, an improvement for future research would be to 
consider this aspect when designing models and attempt to avoid models in which the implicit 
measure forms a single latent factor.

All of these potential limitations may have affected the observed results in varying 
degrees. However, the nature of the measures is believed to have a substantial effect. Although 
the lack of relationships between the P-IAT and EJS measures was unanticipated, it may be 
telling. The IAT stimuli were created to appropriately reference one’s job, without being general 
or overly specific to particular role or an aspect of one’s job. The EJS measures reference global 
job satisfaction or many aspects of one’s work, so it is anticipated that there would be overlap 
between the measures although not complete alignment, as observed. The P-IAT was intended
to capture more personalized attitudes towards one’s work. Although significant positive relationships with EJS measures were anticipated but not observed, a possible explanation may be that the P-IAT was truly accessing more personalized aspects of the constructs whereas the EJS measures were assessing more global aspects.

**Future Research**

Future research should focus on more deeply understanding the personalization of implicit measures from both a methodological and theoretical perspective, as these are inextricably related. Both of these aspects have been a source of debate (e.g., Nosek and Hansen, 2008b), which is why it is critical to address each of them. Gawronski et al. (2008) provides three components of this debate: conceptual – defining extrapersonal associations, methodological – the effects of procedural variations on task performance, and empirical – the observed differences that are assumed to assess these associations. Olson and Fazio (2009) note that two of the key questions to guide future research are understanding how extrapersonal associations originate and then how they are activated. Several authors agree that the concept of personalizing implicit measures is appealing as a concept and worthy of further research (Nosek & Hansen, 2008b; Uhlmann, Poehlman, et al., 2012), even if a consensus has not been reached on the methodological or theoretical components.

One of the key next steps for future research is to explore new methods of personalization to inform the theoretical debate. With the current method of personalization, there is a substantial debate on the interpretation of the correlations with explicit measures and what is being captured. Uhlmann, Poehlman, et al. (2012) have mapped research findings with personalized measures to the various theoretical viewpoints, demonstrating how the results can be interpreted to support each view. However, creating new methods that more directly test the
difference underlying these theories is recommended although none of the key authors have suggested any specific proposals at this time (Nosek & Hansen, 2008b; Uhlmann, Poehlman, et al., 2012).

Another line of future research is to explore the criterion-related validity of currently used personalized measures. Uhlmann, Poehlman, et al. (2012) suggest that instead of solely investigating the relationships between personalized implicit and explicit measures, which does not provide definitive evidence for either side of the debate, that one should examine predictive validity evidence. Direct evidence could be provided by testing whether a personalized implicit measure could outperform a non-personalized measure in predicting a behavior that is theoretically driven by unendorsed automatic attitudes. They provide the example of examining the perceptions of the hostility of ambiguously hostile black and white faces made by social perceivers who are required to respond quickly. Hillard et al. (2011) is one example of research examining the predictive ability of a personalized measure on behavior. They found that positive women-in-science associations predicted the degree of donation to an organization for women in science. The current study included behavioral intention measures to investigate the predictive ability of the implicit personalized measure. More research investigating the predictive ability of personalized measures will help to provide further construct validity, support underlying theory, as well as provide utilitarian value for these measures. To this end, non-self-report criteria should also be examined in future research.

Several significant relationships were found with the traditional IAT, particularly in Study 2, and then the moderating effects of time-related variables across both studies. These effects should be replicated with a different sample, to establish further confidence in related conclusions, particularly considering the inconsistent effects observed across the two samples in
this study. When examining the results from Study 2 alone or the relationships only amongst participants low on the time-related variables, it does appear that the modifications (narrowing the population and altering the stimuli to be more relevant for that population) from previous research (Boyd, 2010) did improve this measure and establish some validity evidence.

The moderating effects of work experience, age, and tenure on the implicit-explicit relationships further support the abundance of prior research indicating the complexity of the construct of job satisfaction. Thus, future research should consider these demographic variables and their potential theoretical relationships with job satisfaction to ensure a broader understanding of the construct. The composition of the current sample on these variables is a potential issue, particularly as research is commonly done with a sample of convenience of college students. Due to the nature of this type of sample, it is likely limited in terms of exploring the effects of a broad range on these demographic variables of age, experience, and tenure. Furthermore, the current sample may not be fully representative of a broader audience on these experience-related variables. Most of the respondents were in the late teen to early 20s age group. Those who were older and more experienced were still necessarily enrolled in college courses in order to participate in the study. Completing a college degree is not a common practice in older age groups; thus, these participants may not have been accurately representative of a wider sample of working adults in this age group. Participants balancing school and work responsibilities in later points in their career, may have a different perspective on job satisfaction than other adults who are not in school. Exploring samples with more variance on these measures, or that are more representative of a broader population, may help to gain a better understanding of the impact of these variables on the implicit-explicit relationships.

A related concern about the potential effects of the sample on the results is the limitation
of participants to the job family of customer service. The reason for this choice was to ensure that the stimuli included in the implicit measures were relevant. However, limiting participants to this type of work could potentially have resulted in an overly homogeneous sample with restriction of range on focal variables. Replicating this research within different job families may provide further understanding of this potential restriction and relationships between study variables.

Alternatively, the specific type of customer service job could have potentially had an effect on key relationships. Several lines of research have found the moderating effect of job type within the customer service industry on the relationship between job satisfaction and other organizational variables (Brown & Mitchell, 1993; Ng & Sorenson, 2008). Although the current study did not find any significant effects of which sub-type of industry the participants self-identified, it is possible that some other aspect of job type influenced the relationships. For example, all participants were required to have customer interaction for at least 70% of their day; however, the nature of that interaction (over the phone, face-to-face, via computer) was not assessed. The nature of these interactions could potentially moderate the relationships with implicit measures.

Future research should also continue to consider the context in which the results of implicit measurement are being interpreted. Initial criterion-related validity evidence in implicit measurement research lead to enthusiasm about their potential application, and some critics claimed their application was beyond that of the actual the empirical findings (e.g., Blanton et al., 2009; De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009). However, as Greenwald et al. (2015) explains, what may be seen as a small effect in other areas of research can be more impactful in implicit measurement if the context is considered. Small effects can be practically
significant, particularly when the behavior is conducted repeatedly or is of great consequence where explaining even a minor portion of variance would be significant.

Although limited, this study did provide some initial construct validity evidence for the IAT assessing the organizationally-relevant attitude of job satisfaction. There has been a call for additional implicit research applied to the work domain (Scherbaum & Meade, 2013), thus future research should continue to explore job satisfaction as well as other work-related variables. These variables are often highly complex and have a large scale when applied to individuals throughout the organization, so even small effects could be highly consequential. Behavioral predictions are particularly valuable and where the IAT has had particular success; therefore future research should continue to explore a variety of implicit work-related attitudes and their relationships with various outcomes, including implicit behaviors.

Conclusion

The current study sought to combine and fill in some gaps in two under researched areas in the literature: implicit measures in organizational contexts and personalization. This study created a new personalized implicit measure of job satisfaction and provided validity evidence to understand its relationships with existing organizationally-relevant attitudes and behaviors. The findings related to this implicit measure were limited and inconsistent across the two studies, although several moderators were identified to explain some of these differences. Thus, much more research needs to be done to identify a more effective personalized implicit measure of job satisfaction moving forward. However, the goals of creating and examining this new measure were reached. As other authors have noted, while the specifics of current personalization methodology are not ideal, the concept of personalizing implicit measures is valuable and worthy of future pursuits (e.g., Uhlmann, Poehlman, et al., 2012).
Endnotes

1 Revised scoring algorithm can be downloaded at http://www.millisecond.com/download/library/IAT/.
2 The basic Single-Target Implicit Association Test syntax can be downloaded at http://www.millisecond.com/download/library/IAT/ST_IAT/.
3 The scoring algorithm can be downloaded at http://www.millisecond.com/download/library/IAT/.
Appendix A

Definition of Customer Service for Pre-qualification of Study Participation

For the purposes of this study, “customer service workers” are defined as: Those who provide assistance directly to customers such as handling customer complaints, processing orders, and providing information about an organization’s products and services. For the purposes of this study, if more than 70% of your daily tasks include providing direct customer assistance, then you may participate in this study. Examples include: customer service agent, cashier (e.g., Starbucks or fast food), waiter/waitress, bank teller, phone sales, and retail sales.

However, if you do participate in one of these jobs but your customer contact is limited (less than 70% of your daily tasks), then you do not qualify to participate in this study. For example, if you work in retail sales as a greeter on the floor, then you would qualify for this study. If you work in retail sales, but mostly in the stockroom, away from customers, then you do not qualify for this study.
### Appendix B

*Overview of the Trials of the Non-Personalized Implicit Job Satisfaction Measure (IAT)*

<table>
<thead>
<tr>
<th>Trial</th>
<th>Positive and Negative Words</th>
<th>Good</th>
<th>Bad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1 (practice)</td>
<td></td>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td>Trial 2 (practice)</td>
<td></td>
<td></td>
<td>Bad or Work</td>
</tr>
<tr>
<td>Trial 3 (critical)</td>
<td></td>
<td></td>
<td>Bad or Work</td>
</tr>
<tr>
<td>Trial 4 (practice)</td>
<td></td>
<td></td>
<td>Bad</td>
</tr>
<tr>
<td>Trial 5 (critical)</td>
<td></td>
<td></td>
<td>Bad</td>
</tr>
</tbody>
</table>
Appendix C

*Stimulus Words for the Implicit Measures of Personalized and Non-Personalized Job Satisfaction (P-IAT, IAT) and Attitudes Towards Christianity*

<table>
<thead>
<tr>
<th>Positive Words</th>
<th>Negative Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wonderful</td>
<td>Horrible</td>
</tr>
<tr>
<td>Great</td>
<td>Terrible</td>
</tr>
<tr>
<td>Joy</td>
<td>Awful</td>
</tr>
<tr>
<td>Awesome</td>
<td>Bad</td>
</tr>
<tr>
<td>Inspiring</td>
<td>Miserable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work-related Words</th>
<th>Christianity-related Words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>Christmas</td>
</tr>
<tr>
<td>Client</td>
<td>Maria</td>
</tr>
<tr>
<td>Patron</td>
<td>Cross</td>
</tr>
<tr>
<td>Service</td>
<td>Bible</td>
</tr>
<tr>
<td>Assistance</td>
<td>Bethlehem</td>
</tr>
</tbody>
</table>
Appendix D

*Spector’s (1997) Job Satisfaction Survey (JSS)*

Please circle the one number for each question that comes the closest to reflecting your opinion about it.

<table>
<thead>
<tr>
<th>Disagree very much</th>
<th>Disagree moderately</th>
<th>Disagree slightly</th>
<th>Agree slightly</th>
<th>Agree moderately</th>
<th>Agree very much</th>
</tr>
</thead>
</table>

1. I feel I am being paid a fair amount for the work I do.
2. There is really too little chance for promotion on my job.*
3. My supervisor is quite competent in doing his/her job.
4. I am not satisfied with the benefits I receive. *
5. When I do a good job, I receive the recognition for it that I should receive.
6. Many of our rules and procedures make doing a good job difficult.*
7. I like the people I work with.
8. I sometimes feel my job is meaningless. *
9. Communications seem good within this organization.
10. Raises are too few and far between. *
11. Those who do well on the job stand a fair chance of being promoted.
12. My supervisor is unfair to me. *
13. The benefits we receive are as good as most other organizations offer.
14. I do not feel that the work I do is appreciated. *
15. My efforts to do a good job are seldom blocked by red tape.
16. I find I have to work harder at my job because of the incompetence of people I work with. *
17. I like doing the things I do at work.
18. The goals of this organization are not clear to me. *
19. I feel unappreciated by the organization when I think about what they pay me. *
20. People get ahead as fast here as they do in other places.
21. My supervisor shows too little interest in the feelings of subordinates. *
22. The benefit package we have is equitable.
23. There are few rewards for those who work here. *
24. I have too much to do at work. *
25. I enjoy my coworkers.
26. I often feel that I do not know what is going on with the organization. *
27. I feel a sense of pride in doing my job.
28. I feel satisfied with my chances for salary increases.
29. There are benefits we do not have which we should have. *
30. I like my supervisor.
31. I have too much paperwork. *
32. I don't feel my efforts are rewarded the way they should be. *
33. I am satisfied with my chances for promotion.
34. There is too much bickering and fighting at work. *
35. My job is enjoyable.
36. Work assignments are not fully explained. *

* Reverse-scored items.
Appendix E

Brayfield and Rothe’s (1951) Overall Job Satisfaction (OJS) Scale

Using the scale provided below each statement, please indicate how much you agree with each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neither Agree nor Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

1. My job seems like a hobby to me.
2. My job is usually interesting enough to keep me from getting bored.
3. It seems that my friends are more interested in their jobs.*
4. I consider my job rather unpleasant.*
5. I enjoy my work more than my leisure time.
6. I am often bored with my job.*
7. I feel fairly well satisfied with my present job.
8. Most of the time I have to force myself to go to work.*
9. I am satisfied with my job for the time being.
10. I feel that my job is no more interesting than others I could get.*
11. I definitely dislike my work.*
12. I feel that I am happier in my work than most other people.
13. Most days I am enthusiastic about my work.
14. Each day of work seems like it will never end.*
15. I like my job better than the average worker does.
16. My job is pretty uninteresting.*
17. I find real enjoyment in my work.
18. I am disappointed that I ever took this job.*

* Reverse-scored items.
Appendix F

Weiss, Dawis, England, and Lofquist’s (1967) Minnesota Satisfaction Questionnaire (MSQ) Scale

The purpose of this questionnaire is to give you a chance to tell how you feel about your present job, what things you are satisfied with and what things you are not satisfied with. On the basis of your answers and those of people like you, we hope to get a better understanding of the things people like and dislike about their jobs.

On the next page you will find statements about your present job.

- Read each statement carefully.
- Decide how satisfied you feel about the aspect of your job described by the statement.

Keeping the statement in mind:
- if you feel that your job gives you more than you expected, select “Very Satisfied”
- if you feel that your job gives you what you expected, select “Satisfied”
- if you cannot make up your mind whether or not the job gives you what you expected, select “Neither Satisfied nor Dissatisfied”
- if you feel that your job gives you less than you expected, check the box under “Dissatisfied”
- if you feel that your job gives you much less than you expected, select “Very Dissatisfied”

On my present job, this is how I feel about…

1. Being able to keep busy all the time
2. The chance to work alone on the job
3. The chance to do different things from time to time
4. The chance to be “somebody” in the community
5. The way my boss handles his/her workers
6. The competence of my supervisor in making decisions
7. Being able to do things that don’t go against my conscience
8. The way my job provides for steady employment
9. The chance to do things for other people
10. The chance to tell people what to do
11. The chance to do something that makes use of my abilities
12. The way company policies are put into practice
13. My pay and the amount of work I do
14. The chances for advancement on this job
15. The freedom to use my own judgment
16. The chance to try my own methods of doing the job
17. The working conditions
18. The way my co-workers get along with each other
19. The praise I get for doing a good job
20. The feeling of accomplishment I get from the job
Appendix G

Explicit Attitude Measures Towards Christianity

Please select one response for each question below.

1. I am positive about Christianity.
2. I am negative about Christianity.

<table>
<thead>
<tr>
<th>Totally Disagree</th>
<th>Moderately Disagree</th>
<th>Slightly Disagree</th>
<th>Neither Agree Nor Disagree</th>
<th>Slightly Agree</th>
<th>Moderately Agree</th>
<th>Totally Agree</th>
</tr>
</thead>
</table>

3. How positively or negatively do you evaluate the Christian religion?

| Extremely Negatively (-4) | Neutral 0 | Extremely Positively (4) |
Appendix H

Demographic Items

1. What is your gender?
   Male
   Female

2. What is your age? (please enter only two digits, in years)

3. What is your ethnicity?
   Asian
   American Indian or Alaskan Native
   Black or African American
   Hispanic/Latino/Spanish Origin
   Native Hawaiian or Other Pacific Islander
   White
   Other

4. If other, please specify:

5. Were you born in the U.S?
   Yes
   No

6. If you were not born in the U.S., how many years have you lived here?

7. Is English your first language?
   Yes
   No

8. Do you currently have a job?
   Yes, full-time
   Yes, part-time
   No, I am not currently working

9. Please indicate how many months you have worked in your current job?

10. How many hours per week (on average) do you currently work?

11. In what industry do you work?
   Goods-Producing: Natural resources and mining: Agriculture, forestry, fishing and hunting & Mining
   Goods-Producing: Construction
   Goods-Producing: Manufacturing
Service-Providing: Trade, transportation, and utilities (Wholesale trade; Retail trade; Transportation and warehousing; Utilities)

Service-Providing: Information

Service-Providing: Financial activities (Finance and insurance; Real estate and rental and leasing)

Service-Providing: Professional and business services (Professional, scientific, and technical services; Management of companies and enterprises; Administrative and support and waste management and remediation services)

Service-Providing: Education and health services (Education services; Health care and social assistance)

Service-Providing: Leisure and hospitality (Arts, entertainment, and recreation; Accommodation and food services)

Service-Providing: Other services, except public administration

Service-Providing: Public administration

Unclassified/Other

12. What type of work do you do? Please indicate your title and a brief description.

13. About how many years of overall working experience have you had across all types of work?

14. What is your major?
Accountancy
Ad Hoc Major
Actuarial Science
Art History and Theatre (Ad Hoc)
Arts Administration (Ad Hoc)
Asian & Asian American Studies (Ad Hoc)
Biological Sciences
Business Journalism
Business Writing
Computer Information Systems
Corporate Communication
Economics
English
Finance
Graphic Communication
History
Industrial/Organizational Psychology
International Business
15. Which of the following courses are you enrolled in currently and seeking course credit by participating in this study?

- PSY1001
- MGT3120
- PSY1001 and MGT3120
- PSY 3056
- Other
Appendix I

Priming Measure – Essay

Please think about your job and spend the next 5 minutes to describe some of the benefits and drawbacks to your work. Please use the space below to type your response.
Appendix J

*Meyer, Allen, and Smith’s (1993) Organizational Commitment Scale*

Using the scale provided below each statement, please indicate how much you agree with each statement.

<table>
<thead>
<tr>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Somewhat nor Disagree</th>
<th>Neither Agree</th>
<th>Somewhat Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
</table>

**Affective commitment**
1. I would be very happy to spend the rest of my career with this organization.
2. I really feel as if this organization's problems are my own.
3. I do not feel a strong sense of "belonging" to my organization.*
4. I do not feel "emotionally attached" to this organization.*
5. I do not feel like "part of the family" at my organization.*
6. This organization has a great deal of personal meaning for me.

**Continuance commitment**
1. Right now, staying with my organization is a matter of necessity as much as desire.
2. It would be very hard for me to leave my organization right now, even if I wanted to.
3. Too much of my life would be disrupted if I decided I wanted to leave my organization now.
4. I feel that I have too few options to consider leaving this organization.
5. If I had not already put so much of myself into this organization, I might consider working elsewhere.
6. One of the few negative consequences of leaving this organization would be the scarcity of available alternatives.

**Normative commitment**
1. I do not feel any obligation to remain with my current employer.*
2. Even if it were to my advantage, I do not feel it would be right to leave my organization now.
3. I would feel guilty if I left my organization now.
4. This organization deserves my loyalty.
5. I would not leave my organization right now because I have a sense of obligation to the people in it.
6. I owe a great deal to my organization.

* Reverse-scored items.
Appendix K

Paullay, Alliger, and Stone-Romero’s (1994) Job Involvement Scale

The following statements ask you about your attitudes toward your present job. Please circle the response alternative which most closely represents your attitude for each of the statements listed below.

<table>
<thead>
<tr>
<th>Disagree</th>
<th>Disagree</th>
<th>Disagree</th>
<th>Neither agree</th>
<th>Agree</th>
<th>Agree</th>
<th>Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>very much</td>
<td>moderately</td>
<td>slightly</td>
<td>or disagree</td>
<td>slightly</td>
<td>moderately</td>
<td>very much</td>
</tr>
</tbody>
</table>

1. I don’t mind spending a half hour past quitting time, if I can finish something I’ve been working on.
2. Often when I am not at work, I find myself thinking about things that I have done or things that need to be done at work.
3. I feel myself to be a part of the workgroup on which I work.
4. Generally, I feel detached from the type of work that I do in my present job.*
5. This work environment really inspires the very best in me in the way of job performance.
6. There is something about the workgroup on which I work that makes me want to do my best.
7. I’ll stay overtime to finish something I’m working on.
8. I just do my own job and forget about such things as parties at work and work activities.*
9. I enjoy doing things with my coworkers.
10. I really feel as if the workgroup’s problems are my problems.
11. I am willing to put in a great deal of effort beyond that normally expected in order to help the company be successful.
12. Sometimes I lie awake at night thinking about the things I have to do the next day at work.
13. In my current job I often do extra work that isn’t required.
14. I am absorbed in the type of work that I do in my present job.
15. I’m really a perfectionist about the work that I do.
16. In general I am involved in my “work environment” (for example, my workgroup or in the company in general).
17. If once a week, after the work day is over, the administration had the employees get together in groups for the purpose of discussing possible job changes or problems, I would remain after quitting time to participate in these discussions.
18. If I had the choice between going to the company picnic or staying home, I would probably stay home.*
19. I am very much involved personally in the type of work that I do in my present job.
20. I would prefer to work in a different setting or organization.*
21. At work, I am very involved in what goes on with others (for example, my coworkers or supervisor).
22. I usually show up for work a little early to get things ready.
23. I am extremely glad that I chose this company to work for, over the other places I was considering at the time I joined.
24. I often try to think of ways of doing my job more effectively.
25. I am really interested in my own work.
26. I do only what my job requires, no more no less. *
27. I am willing to put in a great deal of effort beyond that normally expected in order to help my workgroup be successful.
* Reverse-scored items.
Appendix L

Smith, Organ, and Near’s (1983) Organizational Citizenship Behavior Scale

For each item below, please rate the degree to which the item is characteristic of you.

<table>
<thead>
<tr>
<th>Not at all characteristic</th>
<th>Slightly characteristic</th>
<th>Somewhat characteristic</th>
<th>Moderately characteristic</th>
<th>Very characteristic</th>
</tr>
</thead>
</table>

**Altruism**
1. Helps others who have been absent
2. Volunteers for things that are not required
3. Orient new people even though it is not required
4. Helps others who have heavy work loads
5. Assists supervisor with his or her work
6. Makes innovative suggestions to improve department
7. Attend functions not required but that help company image

**Generalized Compliance**
1. Punctuality
2. Takes undeserved breaks *
3. Attendance at work is above the norm
4. Coasts towards the end of the day*
5. Gives advance notice if unable to come to work
6. Great deal of time spent with personal phone conversations*
7. Does not take unnecessary time off work
8. Does not take extra breaks
9. Does not spend time in idle conversation

* Reverse-scored items.
Appendix M

Fox and Spector’s (1999) Counterproductive Work Behavior Items

Please indicate how often you have participated in the following behaviors.

Never 1 2 3 4 5 6 Extremely Often

1. Purposely wasted company materials/supplies
2. Daydreamed rather than did your work
3. Purposely ignored your boss
4. Complained about insignificant things at work
5. Told people outside the job what a lousy place you work at
6. Purposely did your work incorrectly
7. Felt good when something went wrong
8. Seriously considered quitting your job
9. Purposely came to work or came back from lunch breaks late
10. Stayed home from work and said you were sick when you were not
11. Purposely did not work hard when there were things to be done
12. Purposely damaged a valuable piece of property or equipment belonging to your employer
13. Purposely littered or dirtied your place of work or your employer's property
14. Taken any kind of drug at work to get high (including alcohol)
15. Stolen something from work
16. Tried to cheat your employer
Appendix N

Absence, Lateness, and Turnover Items

**Absence**

1. Please estimate the number of days you were absent from your job in the last three months.
2. Of this total number of absences in the last three months, how many were voluntary (because you didn’t feel like going to work)?
3. Please estimate the number of excused absences in the last year (e.g., missed work for a doctor’s appointment, was truly sick).
4. Please estimate the number of unexcused absences in the last year (e.g., taking a personal day, do not provide employer a reason for not being at work).

**Lateness**

Occasionally, things happen to everyone that make them late for work. Please try to remember the last few times you were late for work and what caused you to be late.

1. How many times have you arrived to work at least 10 minutes late in the last month?
2. How many times have you arrived to work at least 10 minutes late in the last SIX months?
3. When you are late to work, on average, how many minutes are you late? (Please provide a 2-digit number.)
4. When you are late to work, what is the most common reason?
   Transportation delays (train delays; traffic)
   Overslept/Lack of sleep
   Weather
   Childcare issues
   Didn’t feel like rushing
   Co-workers are often late/Boss doesn’t care
   Other

5. If other, please specify:

**Turnover Intention**

*Bothma & Roodt’s (2013) Turnover Intention Items (TIS-6)*

During the past 6 months:

1. How often have you considered leaving your job?
   Never 1 2 3 4 5 Always
2. To what extent is your current job satisfying your personal needs?*
   To no extent 2 3 4 5
   To a very large extent

3. How often are you frustrated when not given the opportunity at work to achieve your
   personal work-related goals?
   Never 1 2 3 4 5
   Always

4. How often do you dream about getting another job that will better suit your personal needs?
   Never 1 2 3 4 5
   Always

5. How likely are you to accept another job at the same compensation level should it be offered
   to you?
   Highly Unlikely 1 2 3 4 5
   Highly Likely

6. How often do you look forward to another day at work?*
   Never 1 2 3 4 5
   Always
   *Reverse-scored.

7. How likely are you to stay in your current job for the next two years?
   Very Unlikely 3 4 5
   Neither Likely 2 3 4 5
   Likely 1 2 3 4 5
   Very

8. It would take a lot to get me to leave my current employer.
   Strongly Disagree 1 2 3 4 5
   Disagree nor Disagree
   Somewhat Agree
   Neither Agree nor Agree
   Neither Agree

The three subsequent items will be measured on the following response scale:
   Strongly Disagree 1 2 3 4 5
   Disagree nor Disagree
   Agree
   Neither Agree

9. I often think about quitting my job.
10. I would be happy staying at my job for the foreseeable future. *
11. I would take another job at the first opportunity.
   * Reverse-scored items.

12. How long do you anticipate staying in your current job?
   Less than 1 month
   2 months – 3 months
   3 months – 5 months
   6 months – 8 months
   9 months – 11 months
1 year – 1.5 years
1.5 years – 2 years
2 years – 2.5 years
2.5 years – 3 years
3 years or more
Appendix O

Other Perspective Items

In the following section you will be asked to answer questions from the perspective of those who you work with. Please imagine that they were asked these questions about you in an interview. For all of the following items, please provide a response in terms of what you think those who you work with would answer if asked about YOU.

OCB

Smith, Organ, and Near’s (1983) Organizational Citizenship Behavior Scale

For each item below, please rate the degree to which those who you work with would say the item is characteristic of you.

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Slightly</th>
<th>Somewhat</th>
<th>Moderately</th>
<th>Very</th>
</tr>
</thead>
<tbody>
<tr>
<td>characteristic</td>
<td>characteristic</td>
<td>characteristic</td>
<td>characteristic</td>
<td>characteristic</td>
</tr>
</tbody>
</table>

OCB - Altruism
1. Help others who have been absent
2. Volunteer for things that are not required
3. Orient new people even though it is not required
4. Help others who have heavy work loads
5. Assist supervisor with his or her work
6. Make innovative suggestions to improve department
7. Attend functions not required but that help company image

OCB - Generalized Compliance
10. Punctuality
11. Takes undeserved breaks *
12. Attendance at work is above the norm
13. Coast towards the end of the day *
14. Give advance notice if unable to come to work
15. Great deal of time spent with personal phone conversations *
16. Do not take unnecessary time off work
17. Do not take extra breaks
18. Do not spend time in idle conversation

* Reverse-scored items.
Fox and Spector’s (1999) Counterproductive Work Behavior Items

Please indicate how often **those who you work with** would say that **YOU** participated in the following behaviors.

<table>
<thead>
<tr>
<th>Never</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Extremely Often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Purposely wasted company materials/supplies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Daydreamed rather than did their work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Purposely ignored your boss</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Complained about insignificant things at work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Told people outside the job what a lousy place you work at</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Purposely did your work incorrectly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Felt good when something went wrong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Seriously considered quitting your job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Purposely came to work or came back from lunch breaks late</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Stayed home from work and said you were sick when you were not</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Purposely did not work hard when there were things to be done</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Purposely damaged a valuable piece of property or equipment belonging to your employer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Purposely littered or dirtied your place of work or your employer’s property</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Took any kind of drug at work to get high (including alcohol)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Stole something from work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Tried to cheat your employer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix P

Supervisor Verification Statement

Your accurate and honest responses are essential to this study. In the following sections you will be asked several more items related to various topics, including your attendance at work. We would like to contact your employer to verify some of this information. Therefore, at the end of this study, you will be asked to provide your supervisor’s name, email address and contact telephone number.
Table 1

*Descriptive Statistics for All Variables- Study 1*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>Skewness</th>
<th>SE</th>
<th>Kurtosis</th>
<th>SE</th>
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</thead>
<tbody>
<tr>
<td>JSS</td>
<td>235</td>
<td>135.95</td>
<td>24.85</td>
<td>.05</td>
<td>.16</td>
<td>.40</td>
<td>.32</td>
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<tr>
<td>OJS</td>
<td>235</td>
<td>57.14</td>
<td>12.42</td>
<td>-.23</td>
<td>.16</td>
<td>.16</td>
<td>.32</td>
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<tr>
<td>MSQ</td>
<td>235</td>
<td>69.09</td>
<td>12.87</td>
<td>-.41</td>
<td>.16</td>
<td>.33</td>
<td>.32</td>
</tr>
<tr>
<td>Christianity</td>
<td>235</td>
<td>.02</td>
<td>.94</td>
<td>-.25</td>
<td>.16</td>
<td>-.44</td>
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<tr>
<td>IAT</td>
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<td>.15</td>
<td>.29</td>
<td>-.21</td>
<td>.16</td>
<td>-.07</td>
<td>.32</td>
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<tr>
<td>P-IAT</td>
<td>235</td>
<td>.14</td>
<td>.34</td>
<td>-.06</td>
<td>.16</td>
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<tr>
<td>Christianity IAT</td>
<td>234</td>
<td>.11</td>
<td>.32</td>
<td>-.24</td>
<td>.16</td>
<td>-.78</td>
<td>.32</td>
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</tbody>
</table>

*Note.* Christianity reflects an aggregated z-score of three explicit items. JSS = Job Satisfaction Survey. OJS = Overall Job Satisfaction. MSQ = Minnesota Satisfaction Questionnaire. IAT = Implicit Association Test (Traditional). P-IAT = Personalized Implicit Association Test.
Table 2

*Study 1: Results of ANOVA Analyses to Test for Order Effects Within Each Dependent Variable*

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>N</th>
<th>df between</th>
<th>df within</th>
<th>F</th>
<th>$\eta^2$</th>
<th>p</th>
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<tbody>
<tr>
<td>JSS</td>
<td>234</td>
<td>5</td>
<td>229</td>
<td>1.48</td>
<td>.03</td>
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<td>OJS</td>
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<td>1.73</td>
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<td>5</td>
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<td>1.20</td>
<td>.03</td>
<td>.31</td>
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<tr>
<td>Christianity</td>
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<td>5</td>
<td>229</td>
<td>1.47</td>
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<td>.20</td>
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<td>IAT</td>
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<td>0.80</td>
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<td>.60</td>
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<tr>
<td>P-IAT</td>
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<td>5</td>
<td>229</td>
<td>1.04</td>
<td>.02</td>
<td>.40</td>
</tr>
<tr>
<td>Christianity IAT</td>
<td>234</td>
<td>5</td>
<td>229</td>
<td>0.77</td>
<td>.02</td>
<td>.58</td>
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</tbody>
</table>

*Note.* * indicates a significant F-ratio at the $p < .05$ level; however, no F-ratios in this table were found to be significant.
Table 3  
*Correlations Between Study 1 Variables (N = 232)*

<table>
<thead>
<tr>
<th>Variables</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>1. JSS</td>
<td>(.91)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. OJS</td>
<td>.67**</td>
<td>(.92)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. MSQ</td>
<td>.79**</td>
<td>.74**</td>
<td>(.90)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Christianity</td>
<td>.15*</td>
<td>.12</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. IAT</td>
<td>.08</td>
<td>.14*</td>
<td>.11</td>
<td>.11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. P-IAT</td>
<td>.04</td>
<td>.09</td>
<td>.06</td>
<td>-.09</td>
<td>.18**</td>
<td>(.92)</td>
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</tr>
<tr>
<td>7. Christianity IAT</td>
<td>.03</td>
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<td>-.01</td>
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*Note:* Values in the diagonal reflect scale reliabilities. *p < .05, **p < .01.
Table 4

*Goodness-of-Fit Indicators for Proposed Models (N = 232)*

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### Table 5

**Study 2: Descriptive Statistics for All Variables**

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# Table 6

*Study 2: Results of ANOVA Analyses to Test for Order Effects Within Each Dependent Variable*

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*Note.* * indicates a significant F-ratio at the $p < .05$ level.
Table 6 continued

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*Note.* * indicates a significant $F$-ratio at the $p < .05$ level.
Table 7

Correlations Between Study 2 Variables (N = 122)

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Note: Values in the diagonal reflect scale reliabilities. *p < .05, **p < .01.
Table 7 (continued)

Correlations Between Study 2 Variables (N = 122)

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Note: Values in the diagonal reflect scale reliabilities. *p < .05, **p < .01.
Table 7 (continued)
Correlations Between Study 2 Variables (N = 122)

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Note: Values in the diagonal reflect scale reliabilities. *p < .05, **p < .01.
Table 8

Summary of Hierarchical Regression Analysis for Hypotheses 10a-e

**H10a – Unique Variance Predicted in OCB-Altruism by P-IAT Beyond Explicit Job Satisfaction**

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**H10a – Unique Variance Predicted in OCB-GC by P-IAT Beyond Explicit Job Satisfaction**

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### Table 8 (continued)

**H10b – Unique Variance Predicted in CWB by P-IAT Beyond Explicit Job Satisfaction**

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*Note:* *p* < .05. **p** < .01.

**H10c – Unique Variance Predicted in Absence by P-IAT Beyond Explicit Job Satisfaction**

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*Note:* *p* < .05. **p** < .01.
Table 8 (continued)

**H10c – Unique Variance Predicted in Absence-Voluntary by P-IAT Beyond Explicit Job Satisfaction**

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**Note:** *p < .05. **p < .01.

**H10c – Unique Variance Predicted in Absence-Voluntary by P-IAT Beyond Explicit Job Satisfaction and IAT**

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**Note:** *p < .05. **p < .01.
Table 8 (continued)

*H10c – Unique Variance Predicted in Absence-Excused by P-IAT Beyond Explicit Job Satisfaction*

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Note: *p < .05. **p < .01.

*H10c – Unique Variance Predicted in Absence-Unexcused by P-IAT Beyond Explicit Job Satisfaction*

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Note: *p < .05. **p < .01.
Table 8 (continued)

### H10d – Unique Variance Predicted in Late-1M by P-IAT Beyond Explicit Job Satisfaction

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*Note: *\( p < .05 \). **p < .01.*

### H10d – Unique Variance Predicted in Late-1M by P-IAT Beyond Explicit Job Satisfaction and IAT

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*Note: *\( p < .05 \). **p < .01.*
Table 8 (continued)

**H10d – Unique Variance Predicted in Late-6M by P-IAT Beyond Explicit Job Satisfaction**

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*Note: *p < .05. **p < .01.*

**H10d – Unique Variance Predicted in Late-Min by P-IAT Beyond Explicit Job Satisfaction**

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*Note: *p < .05. **p < .01.*
Table 8 (continued)

*H10e – Unique Variance Predicted in TIS-6 by P-IAT Beyond Explicit Job Satisfaction*

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*Note:* *p* < .05. **p** < .01.

*H10e – Unique Variance Predicted in TISP by P-IAT Beyond Explicit Job Satisfaction*

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*Note:* *p* < .05. **p** < .01.
Table 8 (continued)

**H10e – Unique Variance Predicted in TI1 by P-IAT Beyond Explicit Job Satisfaction**

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*Note: *$p < .05$. **$p < .01$.  

**H10e – Unique Variance Predicted in TI2 by P-IAT Beyond Explicit Job Satisfaction**

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*Note: *$p < .05$. **$p < .01$.  

Table 8 (continued)

*H10e – Unique Variance Predicted in T13 by P-IAT Beyond Explicit Job Satisfaction*

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*Note:* $^*$ $p < .05$.  $^{**}$ $p < .01$.  


Table 9

Results of Relative Weights Analysis for Hypotheses 10a-e

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<th>OJS</th>
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Note: For the analyses where P-IAT explained the largest portion of variance, a secondary analysis for those predictors were examined, adding IAT as an additional predictor. This secondary analysis is listed in the row below, noted as “With IAT”, in each relevant case.
Table 10

*Exploratory Analyses: Hierarchical Regression Analysis for Experience as a Moderator of the Implicit-Explicit Job Satisfaction Relationship*

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*Note: *p < .05. **p < .01.*

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*Note: *p < .05. **p < .01.*
Table 10 (continued)

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<td>.02</td>
<td>.05</td>
<td>.21</td>
</tr>
<tr>
<td>Experience</td>
<td>.01</td>
<td>.05</td>
<td>.06</td>
<td>.01</td>
<td>.05</td>
<td>.05</td>
</tr>
<tr>
<td>MSQxExp</td>
<td></td>
<td></td>
<td></td>
<td>.04</td>
<td>.05</td>
<td>.30*</td>
</tr>
<tr>
<td>$R^2$</td>
<td>.05</td>
<td></td>
<td></td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td>8.60**</td>
<td></td>
<td></td>
<td>15.43**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05. **p < .01.
Table 11

*Exploratory Analyses: Correlations between IAT and EJS Split by High and Low Years of Work Experience*

<table>
<thead>
<tr>
<th></th>
<th>JSS</th>
<th>OJS</th>
<th>MSQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IAT</strong> (Bottom 25% Experience, N = 99)</td>
<td>.35**</td>
<td>.36**</td>
<td>.41**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td><strong>IAT</strong> (Bottom 25% Experience, N = 96)</td>
<td>-.06</td>
<td>-.07</td>
<td>-.08</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.57</td>
<td>.52</td>
<td>.45</td>
</tr>
</tbody>
</table>

*Note: *p < .05.  **p < .01.*
Table 12

*Correlations Between Study 2 Demographic Variables (N = 348)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Years Experience</td>
<td></td>
<td>.52*</td>
<td></td>
</tr>
<tr>
<td>2 Age</td>
<td></td>
<td></td>
<td>.40*</td>
</tr>
<tr>
<td>3 Months</td>
<td>.39**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 13

*Exploratory Analyses: Correlations between IAT and EJS Split by High and Low Age*

<table>
<thead>
<tr>
<th></th>
<th>JSS</th>
<th>OJS</th>
<th>MSQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IAT</strong>&lt;br&gt;(Bottom 25% Experience, N = 81)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.00</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td><strong>IAT</strong>&lt;br&gt;(Bottom 25% Experience, N = 106)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.56</td>
<td>.47</td>
<td>.30</td>
</tr>
</tbody>
</table>

*Note:* *p* < .05. **p** < .01.
Table 14

Exploratory Analyses: Hierarchical Regression Analysis for Age as a Moderator of the Implicit-Explicit Job Satisfaction Relationship

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>JSS</td>
<td>.13</td>
<td>.05</td>
<td>.13*</td>
<td>.13</td>
<td>.05</td>
<td>.13*</td>
</tr>
<tr>
<td>Age</td>
<td>.08</td>
<td>.05</td>
<td>.08</td>
<td>.05</td>
<td>.05</td>
<td>.05</td>
</tr>
<tr>
<td>JSSxAge</td>
<td></td>
<td></td>
<td></td>
<td>-.23</td>
<td>.06</td>
<td>-.19**</td>
</tr>
<tr>
<td>R²</td>
<td>.03</td>
<td></td>
<td></td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F for change in R²</td>
<td>6.02**</td>
<td></td>
<td></td>
<td>10.20**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *p < .05. **p < .01.
Table 14 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>SE B</td>
<td>β</td>
</tr>
<tr>
<td>MSQ</td>
<td>.17</td>
<td>.05</td>
<td>.17**</td>
<td>.16</td>
</tr>
<tr>
<td>Age</td>
<td>.08</td>
<td>.05</td>
<td>.08</td>
<td>.03</td>
</tr>
<tr>
<td>MSQxAge</td>
<td></td>
<td></td>
<td>-.21</td>
<td>.05</td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>.05</td>
<td></td>
<td>.06</td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td>8.60**</td>
<td></td>
<td>15.43**</td>
<td></td>
</tr>
</tbody>
</table>

*Note: *$p < .05$. **$p < .01$. 
Table 15

*Exploratory Analyses: Correlations between IAT and EJS Split by High and Low Months*

<table>
<thead>
<tr>
<th></th>
<th>JSS</th>
<th>OJS</th>
<th>MSQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bottom 25% Experience, N = 90)</td>
<td>.30**</td>
<td>.42**</td>
<td>.34**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.01</td>
<td>.00</td>
<td>.00</td>
</tr>
<tr>
<td>IAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bottom 25% Experience, N = 85)</td>
<td>-.05</td>
<td>.04</td>
<td>-.05</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.64</td>
<td>.73</td>
<td>.67</td>
</tr>
</tbody>
</table>

*Note:* *p < .05. **p < .01.
Table 16

*Exploratory Analyses: Hierarchical Regression Analysis for Months as a Moderator of the Implicit-Explicit Job Satisfaction Relationship*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>$SE_B$</td>
<td>$\beta$</td>
<td>$B$</td>
<td>$SE_B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>JSS</td>
<td>.13</td>
<td>.05</td>
<td>.13*</td>
<td>.14</td>
<td>.05</td>
<td>.14*</td>
</tr>
<tr>
<td>Months</td>
<td>.02</td>
<td>.05</td>
<td>.02</td>
<td>.04</td>
<td>.05</td>
<td>.04</td>
</tr>
<tr>
<td>JSSxMonths</td>
<td></td>
<td>-.09</td>
<td>.04</td>
<td>-.11*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>.01</td>
<td></td>
<td>.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td></td>
<td>3.21*</td>
<td></td>
<td>4.26**</td>
<td></td>
<td></td>
</tr>
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</table>

Note: *p < .05. **p < .01.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE_B$</td>
<td>$\beta$</td>
<td>$B$</td>
<td>$SE_B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>OJS</td>
<td>.19</td>
<td>.05</td>
<td>.19**</td>
<td>.20</td>
<td>.05</td>
<td>.20**</td>
</tr>
<tr>
<td>Months</td>
<td>.01</td>
<td>.05</td>
<td>.01</td>
<td>.02</td>
<td>.05</td>
<td>.02</td>
</tr>
<tr>
<td>OJSxMonths</td>
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<td>-.07</td>
<td>.04</td>
<td>-.10**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
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<td>.04</td>
<td></td>
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<tr>
<td>$F$ for change in $R^2$</td>
<td></td>
<td>6.71**</td>
<td></td>
<td>3.47</td>
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</tr>
</tbody>
</table>

Note: *p < .05. **p < .01.
Table 16 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>$SE$ $B$</td>
<td>$\beta$</td>
<td>$B$</td>
<td>$SE$ $B$</td>
<td>$\beta$</td>
</tr>
<tr>
<td>MSQ</td>
<td>.17</td>
<td>.05</td>
<td>.17**</td>
<td>.17</td>
<td>.05</td>
<td>.17**</td>
</tr>
<tr>
<td>Months</td>
<td>.01</td>
<td>.05</td>
<td>.01</td>
<td>.02</td>
<td>.05</td>
<td>.02</td>
</tr>
<tr>
<td>MSQxMonths</td>
<td></td>
<td>-.08</td>
<td>.05</td>
<td>-.12*</td>
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<td></td>
</tr>
<tr>
<td>$R^2$</td>
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<td>.05</td>
<td></td>
<td>.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$F$ for change in $R^2$</td>
<td>5.07**</td>
<td></td>
<td></td>
<td>4.49*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: *$p < .05$. **$p < .01$. }
Figure 1. Model 1 of 4 models to test H1 using CFA analysis. Boxes represent observed variables. Ovals represent latent factors. Only one observed behavioral item is listed for each measure as an example. Exact amount of items for each measure will vary. EJS = Explicit Job Satisfaction; NP JS IAT = Non-Personalized Job Satisfaction IAT; P JS IAT = Personalized Job Satisfaction IAT.
Figure 2. Model 2 of 4 models to test H1 using CFA analysis.
Figure 3. Model 3 of 4 models to test H1 using CFA analysis.
Figure 4. Model 4 of 4 models to test H1 using CFA analysis. NPIJS = Non-Personalized Implicit Job Satisfaction; PIJS = Personalized Implicit Job Satisfaction.
Figure 5. Model to test H2 using CFA analysis. Boxes represent observed variables. Ovals represent latent factors. Only one observed behavioral item is listed for each measure as an example. Exact amount of items for each measure will vary.
Figure 6. Additional exploratory model examined in CFA analyses. Boxes represent observed variables. Ovals represent latent factors. EJS = Explicit Job Satisfaction; NP JS IAT = Non-Personalized Job Satisfaction IAT; P JS IAT = Personalized Job Satisfaction IAT.

Chi-Square = 2.23, df = 4, P-value = 0.69, RMSEA = 0.00
Figure 7. Moderating effect of Experience on the relationship between implicit and explicit job satisfaction.

Note: The same pattern was found for each of the three EJS measures (MSQ, OJS, JSS).
Figure 8. Moderating effect of Age on the relationship between implicit and explicit job satisfaction.

Note: The same pattern was found for each of the three EJS measures (MSQ, OJS, JSS).
Figure 9. Moderating effect of Months on the relationship between implicit and explicit job satisfaction.

*Note:* The same pattern was found for two of the three EJS measures (MSQ, JSS).
References


