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Self-Directed Galatea Intervention via Associative Conditioning

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Dedications

This dissertation is dedicated to my parents and my wife. Without their unconditional support, I would not have completed any part of this journey.

ABSTRACT OF THE DISSERTATION

Self-Directed Galatea Intervention via Associative Conditioning

by

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The purpose of this research was to develop a self-directed Galatea intervention that enables individuals to enhance their positive leadership and followership self-expectation through Associative Conditioning (AC). While traditional Galatea interventions are typically administered by a facilitator (e.g., squad leader, researcher, teacher) to enhance individuals' self-expectation through contrived verbal feedback, none of the studies have explored the plausibility of a self-directed Galatea intervention. That is, a self-directed Galatea intervention that enhances individuals' positive self-expectations without any contrived manipulations Results across two studies (total $N = 320$) supported the plausibility of a self-directed Galatea intervention via AC. Study 1 (n = 160) provided evidence for a self-directed Galatea leadership intervention. Individuals in the experimental group who were conditioned to associate themselves with positive leadership schemas perceived themselves more positively as leaders than those in the

control group. Additionally, individuals in the experimental group had higher leadership self-efficacy and social-normative motivation to lead than those in the control group. Study 2 (n = 160) provided evidence for a self-directed Galatea followership intervention. Individuals in the experimental group who were conditioned to associate themselves with positive followership schemas perceived themselves more positively as followers than those in the control group. Lastly, individuals in the experimental group had higher general self-efficacy and personal mastery than those in the control group. Overall, this research contributed to the leadership, followership, AC, and self-fulfilling prophecy literature, offering new insights into leadership and followership processes.

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In the past five decades, hundreds of studies have shown the effectiveness of self-fulfilling prophecy across different settings (e.g., Eden & Kinnar, 1991; McNatt & Judge, 2004; Rosenthal & Jacobson, 1968). Most of the research on self-fulfilling prophecy focused on Pygmalion effects. Pygmalion effects are a special case of self-fulfilling prophecy, whereby increasing leaders' follower expectation affects their behaviors to improve follower outcomes (Eden, 1984). While self-fulfilling prophecy research has mostly focused on Pygmalion effects, fewer research studies have examined Galatea effects. Galatea effects are a special case of self-fulfilling prophecy in which individuals' positive self-expectation leads to positive outcomes. Like Pygmalion effects, studies on Galatea effects have shown the impact on individuals' outcomes, such as motivation (e.g., McNatt & Judge, 2004) and performance (e.g., Eden & Zuk, 1995). However, there is still much to learn about Galatea effects. Specifically, there is a need to devise more creative methods to enhance self-expectation other than verbal feedback (Eden, 2003). Classic examples of self-fulfilling prophecy intervention have shown that self-expectation is key to motivation. Individuals are more motivated to act toward their goals if they have higher self-expectation (e.g., Eden & Kinnar, 1991; McNatt & Judge, 2004). Traditional Galatea interventions are typically administered by a facilitator (e.g., squad leader, researcher, teacher) to increase individuals' (e.g., cadet, workers, students) self-expectation through verbal feedback (e.g., "you have what it takes to overcome any obstacles"). While Galatea interventions are generally effective, nearly all the verbal feedback provided were deceptions used to enhance positive self-expectations (Eden et al., 2000). Deception is problematic in Galatea interventions because it raises ethical

concerns on whether it is acceptable to intentionally deceive individuals about their performance, especially in real world settings. To elicit Galatea effects that are sustainable in real world settings, deceptions should not be deployed to enhance positive self-expectations. As research on self-fulfilling prophecy needs innovative ways to enhance self-expectation, exploring a new method would benefit individuals of all kinds, contributing to the self-fulfilling prophecy literature. Lastly, while there has been ample research on Pygmalion leadership, the notion of Galatea leadership is understudied. The present research examines the plausibility of a self-directed Galatea intervention in leadership and followership contexts.

This research contributes to the literature by being among the first to investigate a self-directed Galatea intervention. As self-directed interventions are quite common in positive psychology for self-improvement (Sin & Lyubomirsky, 2009), the same approach may be used to enhance self-expectation, which is a form of self-improvement. Self-directed Galatea intervention may have major advantages over traditional Galatea interventions. First, while traditional Galatea interventions typically involve deceptive verbal feedback, the current research is conducted without any deceptions. It also allows individuals to manage the intervention themselves, rather than relying on a facilitator. Combined with technology, this research provides a solution to creating a more innovative way of enhancing self-expectations. Almost two decades have passed since Eden's (2003) call to examine new ways of fostering self-expectation. Surprisingly, few insights have been generated to address this need. This research addresses this gap by integrating findings from self-fulfilling prophecy, implicit leadership/followership

theories, and associative conditioning literature. Research shows that positive followership schemas (i.e., positive implicit followership theories; PIFTs) are a vital driver of self-fulfilling prophecy (e.g., Whiteley, Sy, & Johnson, 2012; Sy, 2010) and can serve as proxies for positive self-expectation (Leung & Sy, 2018), that is, individuals who internalize more positive followership schemas are likely to have more positive self-expectations. Similarly, positive leadership schemas (i.e., positive implicit leadership theories; PILTs) can be induced to enhance self-expectations as well (Leung & Sy, 2018), such that workplace leaders who internalize more positive leadership schemas are more likely to have more positive self-expectations and may be more motivated to lead. Therefore, self-directed Galatea interventions could help individuals develop into better followers and leaders, which may impact their organizations' processes and successes.

Research has examined the effects of associative learning on human perception and behaviors (e.g., Bosshard, Koller, & Walla, 2019; Franklin et al., 2016; Olson & Fazio, 2006). One of the most used associative learning methods is Associative Conditioning (AC). AC refers to a change in the evaluation of a *conditioned stimulus* (CS) due to the pairing with an *unconditioned stimulus* (US) (Hofmann, De Houwer, Perugini, & Baeyens, 2010). A CS becomes more positive when it pairs with the positive US and more negative when it pairs with the negative US. In the leadership domain, individuals' self-expectation as leaders may be enhanced as they constantly pair themselves with PILTs that make up their self-schemas of leadership. Likewise, individuals' self-expectation as followers may be enhanced as they constantly pair themselves with PIFTs that make up their self-schemas of followership. Individuals with

more PILTs and PIFTs, then, may think and behave more positively, triggering Galatea effects (Leung & Sy, 2018).

The primary goal of this research is to develop a self-directed Galatea intervention, enabling individuals to enhance their positive leadership and followership self-expectation through AC. Specifically, I suggest that individuals' self-schemas as leaders or followers may be enhanced by constantly pairing an image of themselves (CS) with positive leadership or followership attributes (US). As individuals internalize positive leadership attributes or followership attributes from pairings, they are likely to perceive themselves more positively as leaders or followers (i.e., positive self-schemas of leadership and followership), resulting in higher self-expectation as leaders or followers. To achieve this goal, I conduct two experiments to examine the feasibility of a self-directed Galatea intervention through AC. In the first experiment, I examine the plausibility of enhancing individuals' self-schemas of leadership via AC and whether the enhancement of their self-schemas of leadership would lead to a change in leadership self-efficacy and motivation to lead. In the second experiment, I examine the plausibility of enhancing individuals' self-schemas of followership via AC and whether the enhancement of their self-schemas of followership would lead to a change in their general self-efficacy and personal mastery.

Background of the Study

The Origin of Self-fulfilling Prophecy Research

Over the past five decades, hundreds of studies have shown the impact of self-fulfilling prophecy across different settings, such as classroom (e.g., Friedrich, Flunger,

Nagengast, Jonkmann, & Trautwein, 2015; Reynolds, 2007; Rosenthal & Jacobson, 1968), military (e.g., Eden & Kinnar, 1991; Eden & Shani, 1982; Eden & Zuk, 1995), and workplace (e.g., Karakowsky, DeGama, & McBey, 2012; McNatt & Judge, 2004; Whiteley et al., 2012). Research on self-fulfilling prophecy dates to the mid-1950s when Robert Rosenthal nearly ruined the results of his doctoral dissertation due to experimenter bias (Rosenthal, 2006). Subsequently, Rosenthal and Fode (1963) conducted three experiments to show that interpersonal expectation, such as experimenters' bias, may impact the results of the study. Since then, Rosenthal and colleagues (e.g., Babad, Inbar, & Rosenthal, 1982; Rosenthal & Babad, 1985; Rosenthal & Jacobson, 1968) conducted a series of experiments examining the implications of interpersonal expectation, namely, Pygmalion effects. One of the most well-known studies in the self-fulfilling prophecy literature is Rosenthal and Jacobson's (1968) Pygmalion in the classroom experiment. In this study, they demonstrated that students' performance is significantly better when their teachers have a higher expectation of them. Rosenthal and Jacobson (1968) refer to such interpersonal expectancy effects, Pygmalion effects, whereby increasing individuals' expectations of others impact their behaviors, which then lead to desirable outcomes. Based on the initial studies on Pygmalion effects, Rosenthal (1989) proposed a four-factor theory to explain how teachers' expectations may impact students' school performance. This four-factor theory suggested four significant groupings of teacher behaviors that mediate the relationship between teachers' expectations of their students and students' school performance. The first factor, *climate (affect)*, refers to the warmer socio-emotional climate that teachers create for their high expectancy students. The *input*

(effort) factor refers to the likelihood for teachers to teach more class materials to their high expectancy students. The *output* factor refers to the likelihood of teachers giving high expectancy students more opportunities for responding. Lastly, the *feedback* factor refers to the likelihood of teachers giving more feedback directly related to high expectancy students' responses, rather than general feedback.

In subsequent years, researchers have gone beyond the educational setting and applied the same concept in military and organizational settings. For example, Eden and Shani (1982) successfully produced Pygmalion effects in a field experiment consisted of trainees in a military command course. They found that trainees performed significantly better on the objective achievement tests, showed more positive attitudes, and perceived more positive leadership behavior from instructors who had been induced to expect high performance from them. Trainees who were deemed high potential also had greater satisfaction with the command course and were more motivated to move onto the next course.

As more empirical research showed the effectiveness of Pygmalion effects, Eden (1984) suggested that self-fulfilling prophecy, such as Pygmalion effects, can be used as a management tool. As Rosenthal (1989) suggested that specific teacher behaviors mediate the relationship between teacher expectation and student performance, Eden (1984), too, suggested variables that mediated the relationship between leader expectation and subordinate performance. In Eden's (1984) model of the self-fulfilling prophecy at work (see Figure 1), he suggested five variables form a closed causal chain. The first causal link in the chain consisted of a leader's expectancy and leadership behaviors (path

1). Leaders with positive expectations tend to exhibit more leadership behaviors toward their subordinates (Eden & Shani, 1982). Leadership behaviors were measured by four factors: support, goal emphasis, work facilitation, and interaction facilitation. When leaders are invested in supporting their subordinates to reach their goals while facilitating work with frequent interactions, their subordinates are likely to believe they have what it takes to get things done. As such, subordinates are likely to have a positive self-expectation due to their leaders' enactment of leadership behaviors (path 2).

According to the expectancy theory of motivation, subordinates are more motivated to perform when they have a positive self-expectation (Campbell & Pritchard, 1976) (path 3). With the boost in motivation, subordinates are likely to invest more time and effort on their tasks, leading to higher performance (path 4). Indeed, evidence has demonstrated that, with a boost in self-expectations, individuals are more motivated, which impacts their task performance (e.g., McNatt & Judge, 2004). The causal chain is completed when subordinates' performance impacts their leaders' expectations (path 5). Because in nonexperimental settings, leaders' expectations of their subordinates may occur naturally without any experimental manipulations, subordinates' past performance is likely to impact leaders' expectations of them. Indeed, researchers have provided evidence that *naturally occurring Pygmalion effects* occur in organizational settings (Whiteley et al., 2012). Leaders with more positive schemas of followers were likely to have higher follower expectations, triggering Pygmalion effects. Lastly, subordinates' performance also impacts their self-expectations (path 6) because their mastery

experiences (e.g., performed well on a task previously) increase their self-expectation (Bandura, 2010).

Meta-analyses have shown self-fulfilling prophecy is well-substantiated and have important implications (e.g., Kierein & Gold, 2000; McNatt, 2000; Rosenthal & Rubin, 1978). In the early years, Rosenthal and Rubin (1978) found an average effect size of d = 0.70 based on 345 studies in educational and laboratory settings. In subsequent years, researchers examined whether educational and laboratory settings would generalize to the organizational setting. McNatt (2000) conducted a meta-analysis of 17 studies to examine the existence and relative magnitude of self-fulfilling prophecy among adults in the organizational settings. His meta-analytical results demonstrated that self-fulfilling prophecy could have a strong effect size (average d = 1.13) based on different moderating variables. Specifically, results suggested that effects were stronger in military settings, with men, and when studies involved individuals who had a low level of performance before the experiment.

In a different study, Kierein and Gold (2000) examined the overall magnitude effect of self-fulfilling prophecy research in organizational settings and found an average d of 0.81 across 13 studies. While the overall effect sizes in the two studies were somewhat different, Kierein and Gold (2000) noted the difference might due to the methods and criterion used, such as moderator variables used, studies inclusion criteria, and statistical methods used. In both studies, the effect size of self-fulfilling prophecy was significantly stronger in military settings than in other settings. Individuals who had a low level of performance before the experiment were more responsive to self-fulfilling

prophecies. Both studies found ample evidence for the effects of self-fulfilling prophecy when leaders were men. However, results from Kierein and Gold's (2000) study suggested that the effect of self-fulfilling prophecy still occurred when women were leaders, though such effects were slightly smaller than when men were leaders.

Lastly, Avolio, Reichard, Hannah, Walumbwa, and Chan (2009) conducted a meta-analysis to examine the impact of Pygmalion leadership interventions. Their results revealed that Pygmalion leadership interventions had the largest impact in comparison to other leadership interventions that were based on different leadership theories. Specifically, Pygmalion leadership interventions had the highest success rate compared to non-Pygmalion leadership interventions. Furthermore, Pygmalion leadership interventions had the largest impact on individuals' behavioral/performance (e.g., leader emergence, participation) and cognitive outcomes (e.g., idea generation, confidence) and had similar impact to other leadership interventions on affective outcomes (e.g., liking, satisfaction).

Galatea Effects

A few years after conducting experiments on Pygmalion effects in military settings, Eden and Ravid (1982) explored the possibility of direct manipulation of trainee self-expectation. While Pygmalion effects were produced by raising instructor expectations of their trainees, similar results were produced by only manipulating trainee self-expectations. That is, self-fulfilling prophecies can occur with or without raising instructor expectations toward trainees. As depicted in Figure 1, trainee/subordinate self-expectation appears to mediate Pygmalion effects and can be directly manipulated to

produce similar behavioral gains. Such a process is called Galatea effects (Eden, 1984). *Galatea effects* refer to a special case of self-fulfilling prophecy whereby increasing individuals' self-expectations impact their behaviors, leading to desirable outcomes, such as high performance.

Several studies have demonstrated the existence of Galatea effects by enhancing individuals' self-expectation to boost their performance (e.g., Eden & Kinnar, 1991; Eden & Zuk, 1995; McNatt & Judge, 2004). Studies examining Galatea effects have typically used self-efficacy to measure self-expectation. Self-efficacy refers to individuals' beliefs about their capabilities to perform (Bandura, 2010). As such, elevating individuals' beliefs of their capabilities would elicit Galatea effects, resulting in greater performance. For example, Eden and Zuk (1995) experimentally induced self-efficacy by verbally telling a group of cadets that they were unlikely to experience seasickness. Even if they had experienced it, it would not impair their task performance. Subsequently, cadets, who received the self-efficacy boost, reported less seasickness and performed significantly better than those who did not receive the self-efficacy boost.

Other studies have also demonstrated the existence of Galatea effects in work settings. Researchers induced self-efficacy in interviews among auditors at a major accounting firm (McNatt & Judge, 2004). As part of an interview, auditors were asked to highlight their achievements and the obstacles they came across in their jobs. Researchers induced self-efficacy in auditors by attributing successes to their ability and effort, while suggesting they had what it takes to overcome any obstacles. Their results showed that Galatea effects were produced among auditors. Auditors who received a boost in self-

efficacy were more motivated and performed better than those who did not receive the treatment.

As Pygmalion effects occur naturally without any artificial manipulation (Whiteley et al., 2012), recent research has also demonstrated Galatea effects occur naturally at work without artificial manipulation, namely, *naturally occurring Galatea effects* (Leung & Sy, 2018). Evidence showed that followers who belong to workgroups with more positive followership schemas are likely to internalize their group positive followership schemas, triggering Galatea effects. As a result, they are likely to have higher self-efficacy, effort, and performance. The reverse is also true, such that followers who belong to workgroups with more negative followership schemas are likely to have lower self-efficacy, effort, and performance (Leung & Sy, 2018). Results from these studies suggest Galatea effects can occur with or without the direct manipulation of individuals' self-efficacy. In work settings, individuals' followership schemas may impact their self-expectation, which in turn, triggering Galatea effects.

Pygmalion effects and Galatea effects are closely related; however, the underlying mechanism driving each effect can be somewhat different. In traditional Pygmalion interventions, the focus is on manipulating a higher position individual's (e.g., leader, teacher) expectation of individuals at a lower position (e.g., subordinates, students). The top-down process activates the chain of variables shown in Figure 1. While the process of Pygmalion effects (path 1 and 2) also activates Galatea effects (path 3 and beyond), Galatea effects can be elicited by solely focusing on manipulating self-expectation (e.g., self-efficacy). Based on the theoretical model shown in Figure 1, Galatea effects seem to

be more crucial to individuals' success than Pygmalion effects because Galatea effects can occur with or without Pygmalion effects, but Pygmalion effects may only occur with the presence of Galatea effects. Therefore, it is important to consider innovative constructs and methods to foster self-expectation, as Eden (2003) has suggested.

Leadership and Followership Schemas

Research showed that individuals have schemas of leaders and followers, namely, implicit leadership theories (ILTs; Lord, Foti, & de Vader, 1984; Lord & Maher, 1991) and implicit followership theories (IFTs; Sy, 2010). ILTs represent individuals' schemas of attributes that characterize leaders, while IFTs represent individuals' schemas of attributes that characterize followers. Research from decades ago has demonstrated that individuals use their schemas to categorize others to simplify the complexity of their social interactions. These schemas are established as early as in childhood through socialization (Antonakis & Dalgas, 2009; Ayman-Nolley & Ayman, 2005) and continued to be developed as individuals interact with others (Lord & Maher, 1991; Sy, 2010). Individuals use their leadership schemas as "sensemaking" mechanisms (Weick, 1995) to interpret, understand, and respond to leader behaviors (Poole, Gioia, & Gray, 1989). Similarly, followership schemas are used to interpret, understand, and respond to follower behaviors.

ILTs and IFTs respectively are used to categorize people into (1) leaders and non-leaders and (2) followers and non-followers, based on the perceived match between their behaviors and attributes of a pre-existing leader and follower prototype (Epitropaki, Sy, Martin, Tram-Quon, & Topakas, 2013). Prototypes are defined as abstract composites of

the most representative member within a category (Sy, 2010). Prototypes are based on central tendency (i.e., typical leader or follower) or goal-derived (i.e., ideal leader or follower) (Barsalou, 1985). Both ILTs and IFTs are assessed and described as central tendency prototypes consisting of six dimensions. Epitropaki and Martin (2004) found ILTs to be represented by an overall positive leadership prototype (i.e., Sensitivity, Intelligence, Dynamism, Dedication) and an overall negative leadership prototype (i.e., Tyranny, Masculinity), while Sy (2010) found IFTs to be represented by an overall positive followership prototype (i.e., Industry, Enthusiasm, Good Citizen) and an overall negative followership prototype (i.e., Conformity, Insubordination, and Incompetence). Together, these prototypes make up individuals' leadership and followership schemas.

Researchers have investigated how individuals' patterns of ILTs in self and ideal leader profiles are associated with each other (Foti, Bray, Thompson, & Allgood, 2012). Four profiles emerge for self-leader perceptions (i.e., Prototypical, Laissez-Faire, Narcissistic, Anti-Prototypical) and for ideal leader perceptions (i.e., Prototypical, Laissez-Faire, Autocratic, Anti-Prototypical). Prototypical leaders show a pattern of higher than average ratings in the Sensitivity, Intelligence, and Dedication dimensions, and lower than average in the Tyranny dimension. Laissez-faire leaders show a pattern of lower than average in the Intelligence, Dedication, and Tyranny dimensions, and average in the Sensitivity dimension. Narcissistic leaders show a pattern of higher than average in the Intelligence, Dedication, and Tyranny dimensions, and average in the Sensitivity dimension. Anti-prototypical leaders show lower than average responses in the Sensitivity, Intelligence, and Dedication dimensions, and higher than average in the

Tyranny dimension. As for the ideal leader profiles, similar profiles have emerged except for narcissistic leaders. In addition, autocratic leaders have emerged as the fourth ideal leader profile, which show a pattern of higher than average in the Intelligence and Tyranny dimensions, average in the Dedication dimension, and lower than average in the Sensitivity dimension. Their results also suggest that, while the level of congruence between self-leader and ideal-leader profiles (e.g., Prototypical leaders endorsed a prototypical ideal leader) is relatively high, there is some variability in some self-leader and ideal leader profiles. For example, while narcissistic leaders tend to endorse laissez-faire leaders, they are also likely to endorse prototypical leaders. In addition, while laissez-faire leaders tend to endorse laissez-faire leaders, they are also likely to be identified as narcissistic leaders or anti-prototypical leaders.

While most of the research on ILTs have typically focused on the classification and identification of leaders, researchers have begun examining the antecedents and outcomes of ILTs (Epitropaki et al., 2013). For instance, a study shows that personality characteristics such as agreeableness, conscientiousness, openness, neuroticism, extroversion, and self-monitoring may serve as antecedents of ILTs (Keller, 1999). While both men and women tend to share similar perceptions of a prototypical leader, early research suggests women expect leaders to be more understanding and sincere (i.e., Sensitivity dimension), and less domineering, pushy, and manipulative (i.e., Tyranny dimension) than men. Regarding the outcomes, the congruence between employees' ILTs and their managers' ILTs is positively related to the quality of leader-member exchange, which influences their organizational commitment, job satisfaction, and well-being

(Epitropaki & Martin, 2004). Furthermore, research have also demonstrated that ILTs are related to individuals' self-efficacy and motivation to lead (Schyns, Kiefer, & Foti, 2020). Specifically, individuals who believe they hold more positive dimensions of ILTs than typical leaders are likely to have higher leadership self-efficacy and motivation to lead. ILTs have also shown to be important in family environments. One study shows that adolescents raised in high-conflict families are more likely to endorse tyrannical leaders in their adulthood more than 20 years later (Walker, Reichard, Riggio, & Hansbrough, 2020).

Although researchers have only started examining IFTs a decade ago, IFTs have already been shown to be useful for understanding both leadership and followership processes (Epitropaki et al., 2013). Sy (2010) found gender, age, and education group differences in IFTs. For instance, male leaders rated both Insubordination and Enthusiasm dimensions higher than female leaders; older leaders rated the negative prototype (i.e., Conformity, Insubordination, Incompetence) lower than younger leaders; less-educated leaders rated the positive prototype (i.e., Industry, Enthusiasm, Good Citizen) lower than more-educated leaders. In a recent study, researchers showed that the role of an ideal follower is more associated with female with both an explicit test and implicit test (i.e., implicit association test; IAT), suggesting that women are often perceived to be an ideal fit for followership roles (Braun, Stegmann, Hernandez Bark, Junker, & van Dick, 2017). IFTs also contribute to the process of unethical leadership. Specifically, good citizens are likely to obey their leaders' unethical advice while insubordinate followers are less likely to follow their leaders' unethical advice (Knoll,

Schyns, & Peterson, 2017). In studies examining self-fulfilling prophecies, researchers found that leaders who internalize positive IFTs are more likely to have a higher expectation for their followers, triggering Pygmalion effects (Whiteley et al., 2012). Similarly, those who internalize their workgroup's positive IFTs are likely to have higher self-expectation, eliciting Galatea effects (Leung & Sy, 2018). The reverse is also true, such that workgroup followers who internalize their workgroup's negative IFTs are likely to have lower self-expectation, impairing their overall performance (Leung & Sy, 2018).

Beyond research on self-fulfilling prophecies, IFTs have found to be pertinent to other work outcomes. One study shows that leaders who have more positive IFTs are likely to have better dyadic relationships with their employees and impact their employees' perceptions of organizational support. This, in turn, positively impacts their career success (Gao & Wu, 2019). In another study, positive leaders' IFTs have found to be positively related to employees' internal and external marketability (Su, Gao, He, & Zhu, 2019). Research also shows that leaders' positive IFTs are positively related to individuals' creative role identity, creative self-efficacy, and their willingness to create knowledge creativity (Wang & Liang, 2020). Moreover, positive leaders' IFTs have found to be positively related to followers' creativity through their intrinsic motivation, creative self-efficacy, and dyadic relationships with their leaders (Kong, Xu, Zhou, & Yuan, 2019). In a study examining age discrimination at work, IFTs have found to be a mediating factor of employees' age and their work outcomes, such as psychological health and job attitudes (Stegmann, Braun, Junker, & van Dick, 2020).

Researchers have also found that the congruence between leaders' positive IFTs and followers' self-rated positive IFTs predicts benevolent leadership (Wang & Peng, 2016). In particular, ratings of benevolent leadership are higher when leaders' positive IFTs are congruent with followers' self-rated positive IFTs. That is, leaders are likely to treat their followers as family members when followers' self-rated positive IFTs are similar to their leaders' positive IFTs. In a different study, researchers show that the congruence between leaders' IFTs and their conceptions of their actual follower influence relationship, in-role performance, and counter-productive work behaviors. Specifically, the congruence between positive leaders' IFTs and their positive conceptions of their actual follower was positively related to the leader-follower dyadic relationship and in-role performance (Goswami, Park, & Beehr, 2020). Furthermore, the congruence between high levels of negative IFTs and negative experiences with their actual followers is related to lower in-role performance and higher counter-productive work behaviors. Researchers have also examined implications of ideal and counter-ideal IFTs, demonstrating that the fit between ideal and actual follower is positively related to leader-follower dyadic relationship, organizational citizenship behavior, and follower performance. The fit between counter-ideal and actual follower is negatively related to leader-follower dyadic relationship, organizational citizenship behavior, and follower performance (Junker, Stegmann, Braun, & Van Dick, 2016).

Self-schemas of Leadership and Followership

Research on self-perception suggested that individuals have cognitive structures about themselves in specific social domains, referred to as *self-schemas* (Markus, 1977).

Self-schemas are considered smaller mechanisms of self-concepts, and they serve as cognitive mechanisms that automatically shape individuals' self-perceptions, memories, emotional and behavioral responses (Markus & Wurf, 1987). Broadly defined, *self-concepts* are cognitive structures that include content, attitudes, or evaluative judgments that help individuals make sense of the world (Oyserman & Markus, 1998). Because self-schemas are smaller components of self-concepts, self-schemas in a specific domain may change but not necessarily the entire self-concept. According to this view, individuals' behaviors as a leader and follower are functions of how they view themselves (i.e., self-schemas) as a leader and follower in each domain (Hannah, Woolfolk, & Lord, 2009). Meaning, individuals have a set of self-expectations as leaders and followers when interacting with others. In the work domain, individuals' self-schemas of leadership (i.e., ILTs) and followership (i.e., IFTs) are activated in different social contexts to provide meaning and guidance for their behaviors. For example, middle-level managers in hierarchical organizations are likely to hold both self-schemas of leadership and followership, given their frequent interactions with their supervisors and subordinates (Epitropaki, Kark, Mainemelis, & Lord, 2017). When they interact with their subordinates, their self-schemas of leadership are activated to fulfill the leadership role and enact leadership behaviors. Conversely, they are likely to activate their self-schemas of followership and enact followership behaviors as they interact with their supervisors.

Self-schemas may vary in strength based on their experience in each domain (Markus, 1977). The strength of individuals' self-schemas of leadership and followership are determined by (a) processing information about the self in the leadership and

followership domain, (b) retrieving behavioral evidence from the leadership and followership domain, (c) predicting their future behaviors in the leadership and followership domain, and (d) resisting counter schematic information about themselves as leaders and followers, which suggests individuals can construct their past, present, and future selves in leadership and followership domains based on the strength of their self-schemas as leaders and followers. Future-representations of the self are referred to as *possible selves*. Possible selves are defined as personalized, detailed, sematic enactive conceptions of individuals' selves striving to become in the future (Markus & Nurius, 1986). As the strength of individuals' self-schemas of leadership develop, they may start to envision themselves as leaders rather than followers. Therefore, individuals with well-developed self-schemas of leadership are likely to adopt leadership roles (Smith, Brown, Lord, & Engle, 1998) and enact leadership behaviors in the future (Johnson, Venus, Lanaj, Mao, & Chang, 2012). Similarly, those with well-developed self-schemas of followership are likely to adopt followership roles and enact followership behaviors. Accordingly, improving individuals' self-schemas of leadership and followership should also improve their self-expectations as a leader and follower, triggering Galatea effects.

Associative Conditioning

Associative Conditioning has a long history in behavioral sciences. Throughout the years, different forms of Associative Conditioning have been used to alter perceptions and behaviors such as Evaluative Conditioning (De Houwer, Thomas, & Baeyens, 2001) and Attribute Conditioning (Förderer & Unkelbach, 2015). While both methods are commonly used to elicit desirable conceptual changes by pairing a *conditional stimulus*

(CS) with an *unconditional stimulus* (US), the main difference rest on their focuses. Specifically, Evaluative Conditioning focuses on producing a generally positive or negative evaluation for a target, such as the likability of people, behaviors, or brands (De Houwer, 2007). Attribute Conditioning, on the other hand, focuses on the change in the assessment of a person's attributes, such as "athletic," "healthy," and "sexy." Attribute Conditioning is a relatively new concept and uses a similar method as Evaluative Conditioning to associate individuals with the evaluation for a specific target/person. Accordingly, I refer both Evaluative and Attribute conditioning as Associative Conditioning (AC) for the purpose of this study.

One of the most prominent ways of altering people's attitudes toward a stimulus is by AC. Since its inception, AC has been researched in different domains, including social psychology (e.g., Olson & Fazio, 2006), personality psychology (e.g., Vogel, Hutter, & Gebauer, 2019), clinical psychology (Franklin et al., 2016), consumer psychology (e.g., Allen & Janiszewski, 1989), and neuroscience (e.g., Bossbard et al., 2019). One of the first studies demonstrating AC dates back to more than 60 years ago, where Staats and Staats (1958) demonstrate attitudes can be changed via conditioning. Specifically, when different attributes (e.g., "pretty," "sweet," "healthy) (US) are paired with nonsense words (CS), people's evaluation of nonsense words become associated with those attributes. More recently, studies find that self-cutting episodes, suicide plans, and suicidal behaviors can be reduced when negative US (e.g., the word "danger," a photo of a snake) are paired with CS (e.g., a photo of cutting behavior) (Franklin et al., 2016). While AC typically involves changing the evaluation of a neutral CS, a recent

study shows that even well-established valence toward popular brands can be changed when paired with positive and negative sounds (US) (Bossbard et al., 2019).

Theoretical Accounts

There are several theoretical accounts that attempt to explain the mental processes of AC, including the referential account, holistic account, implicit misattribution account, conceptual categorization account, and the propositional account (Hofmann et al., 2010). These theoretical accounts vary in their assumptions of mental processes that impact the effects of AC. The referential, holistic, and implicit misattribution accounts concern with the mental association between CS and US that, in turn, impacts memory formation. On the contrary, conceptual categorization and propositional account concerns with higher-order mental processes in the effects of AC.

The *referential account* suggests AC occurs due to an automatic formation of an automatic association between CS and US (Baeyen, Eelen, Crombez, & Van den Bergh, 1992). According to this account, there are two types of learning. The first type concerns the learning of predictions such that a CS becomes a signal for a US (i.e., expecting US to occur after the occurrence of CS). The second type concerns the relations in which CS becomes a stimulus that activates a mental representation of the US, without expecting the appearance of US. Referential learning is assumed to depend on the number of CS-US co-occurrences rather than statistical contingency responsible for the occurrence of AC. Mathematically, statistical contingency is computed as the number of paired CS-US trials divided by the sum of paired CS-US trials, CS-only trials, and US-only trials (Hofmann et al., 2010). Furthermore, referential learning is assumed to be resistant to

extinction; once the association between the CS and the US is established, the association will last even after CS-only and US-only trials.

The *holistic account* suggests that the co-occurrence of CS and US leads to the automatic formation of the holistic CS-US representation (Levey & Martin, 1975; Martin & Levey, 1994). When the holistic representation is formed, CS can then activate the holistic representation as well as the evaluation associated with the US. The holistic account suggests that conditioned changes in evaluation rely on CS-US co-occurrences and that CS-only trials should not change the holistic representation and evaluation. Like the referential account, the holistic account suggests that AC is resistant to extinction and does not depend on the awareness of CS-US contingencies.

The *implicit misattribution account* is very much in common with the holistic account. According to this account, the evaluative reaction is evoked by the US that forms the association with the CS. The associative representation is similar to a holistic representation, containing features of the CS and the evaluative response element of the US (Jones, Fazio, Olson, 2009). AC is assumed to be formed without CS-US contingency and depends on an "implicit misattribution" process. During the conditioning process, evaluative responses to the US are likely to become incorrectly attributed to the CS because such responses are elusive, and the actual source of the experience is unclear (Russell, 2003). Hence, individuals assume their evaluation is caused by the CS and not by the US. In addition, the implicit misattribution account also suggests the effects of AC are larger for stimuli that share similarities perceptually and contingency awareness may counteract the misattribution.

The *conceptual categorization account* suggests that AC effects occur due to conceptual learning rather than forming the association in memory (Field & Davey, 1999). According to this view, the change in the evaluation of the CS occurs because the association between the CS and the US makes common features of the CS and the US salient. As such, the CS is more likely to be more a favorable or less favorable stimulus, depending on whether you pair the CS with positive or negative US. The conceptual categorization account also suggests that AC depends highly on the number of co-occurrences of the CS and US, increasing the salience of specific CS attributes. Once the CS attributes are made salience, it is assumed that the change in evaluation persists even during CS-only and US-only trials. Therefore, AC is resistant to extinction, according to this view.

Lastly, the *propositional account* assumes AC depends on a non-automatic formation and evaluation of propositions about the relationship between the CS and the US (De Houwer, Baryens, & Field, 2005). According to this view, the evaluation of the CS changes after individuals form the conscious proposition that the CS is associated with the US. As the propositional account suggests, AC is a conscious mental process, the effects of AC should depend highly on the awareness of CS-US contingency. Meta-analytic results show support for the notion that AC is impacted by higher-order, propositional processes as AC yield the biggest effects when individuals are aware of CS and US contingency (Hofmann et al., 2010).

Conditions and Principles of AC

While some researchers conceptualize AC as an automatic process that encode mere co-occurrences between CS and US, independent of the pair's validity and relational meaning, Corneille and Stahl's (2019) recent review suggests that this stance is unlikely to be true, such that AC relies on contingency awareness and cognitive resources. Specifically, they examine the four operating conditions and two operating principles that are commonly used to explain the process of AC. Operating conditions refer to the idea that perceptions can be changed or form automatically. That is, the effects of AC can be obtained unconsciously, efficiently, independently of goals/tasks, and uncontrollably. The two operating principles refer to the idea that AC produces the unqualified registration of mere co-occurrences between stimuli and the formation of direct stimulus-response links.

The unawareness condition suggests that AC may occur without individuals' awareness. That is, individuals are unaware of the CS-US pairing during the conditioning process. Researchers typically test whether AC can be obtained without awareness through correlational and experimental approaches. In correlational research, researchers tend to rely on individuals' CS-US memory as a proxy for CS-US awareness during the conditioning process. However, this implies that these researchers are examining individuals' CS-US memory, rather than examining whether AC effects can occur without individuals' awareness. Research has provided evidence supporting the view that CS awareness is necessary. For example, one study manipulates the CS's placement (i.e., foveal or parafoveal field) of individuals' vision, while keeping the US at the center of a screen (Dedonder, Corneille, Bertinchamps, & Yzerbyt, 2014). Results show that

individuals can only identify the CS-US pair when the CS is presented in their foveal field. Moreover, AC effects can only be obtained when the CS is presented in their foveal field. These results suggest that the effects of AC rely heavily on the contingency awareness of the CS-US pair. When the CS is placed outside of the foveal field (i.e., parafoveal field), individuals are unable to identify the CS-US pair and AC effects are unobtainable. Lastly, evidence of subliminal AC effects seems relatively weak (Corneille & Stahl, 2019). Beyond yielding significantly smaller effects (Hofmann et al., 2010), subliminal studies often fail to meet the criteria (i.e., relevance, sensitivity, and nonreactivity) for examining the notion of consciousness-independent AC effects, that is, AC effects that are obtained without the conscious identification of the CS. To examine whether AC can occur without the conscious identification of the CS, researchers should use measures that are relevant to the learning task to capture individuals' awareness. That is, their awareness measure should capture all conscious information that individual may use to inform their perceptions or attitudes. Second, their awareness measure needs to be reliable and sensitive for the relevant information during the AC process. If their awareness measure is less reliable than the evaluative measure, the presence of awareness might be undetectable, and results may suggest that AC effects are obtained without individuals' awareness. In addition, researchers should conduct brief recognition-based awareness checks immediately after the presentation of the stimuli to optimize sensitivity. Third, sensitivity demands should be balanced with awareness measures that are nonreactive to avoid distorting awareness during the AC process. Individuals' awareness

may be distorted if the awareness of CS-US co-occurrence is constantly assessed after each trial.

For AC to be efficient, research must demonstrate that AC effects occur even if participants pay little attention to the CS-US pairing. Studies have repeatedly found demands on cognitive resources reduce individuals' memory for CS-US contingencies, as well as reducing the effect of AC significantly (e.g., Dedonder, Corneille, Yzerbyt, & Kuppens, 2010; Mierop, Hütter, & Corneille, 2017). In addition, research have shown that not only does AC take up cognitive resources, but its effects can only occur when individuals' attentions are directed to CS-US contingencies (Kattner, 2012). These findings contradict the efficiency condition in which AC can be efficiently acquired, without much attention.

Research has also failed to support the goal independence condition (Corneille & Stahl, 2019). For example, effects of AC do not occur when participants are distracted from processing the valence-relevant proportion of a task (Gast & Rothermund, 2011). AC effects are bigger when the task makes individuals focus on the CS-US pairing process, while smaller AC effects are found when the task focuses on the valence-irrelevant (e.g., brightness, old/young face) rather than valence-relevant (e.g., positive/negative) proportion of the CS-US pair. As AC effects depend on the manipulation of the task and that bigger AC effects are observed when the task is valence-relevant, researchers have concluded that AC effects are goal dependent.

The last condition, however, there seems to be strong evidence supporting the idea that AC effects are uncontrollable. For example, Hütter and Sweldens (2018) use a

process dissociation procedure to show support for the uncontrollability condition. Individuals are first told to rate the valence of 102 portraits on a scale from "very unpleasant" to "very pleasant." Upon completion, portraits that are rated with the most neutral ratings are used as the CS. A set of 50 unambiguously pleasant and 50 unambiguously unpleasant pictures is used as the US. In the standard condition, individuals are told to link the valence of the US with the CS to form an evaluation (e.g., this pleasant picture is informative about the person). Accordingly, normal AC effects occur due to both controllable and uncontrollable processes. In the reversal condition, however, individuals are told that valence of the US is contrary to the one presented to form correct evaluations of the CS (e.g., this pleasant picture is informative about the person, but it is opposite to what is actually right). Results of this study demonstrate that individuals may fail to control their evaluation of the US for the paired CS. Even when they are asked to evaluate the US based on its reversed valence of the US during the pairing process, they might not be able to do so. When they fail to control their evaluation, the CS may still acquire the US's valence despite incentivized control instructions.

Beyond the four conditions, two principles are commonly used to explain the process of AC. The first principle suggests that AC can occur when mere co-occurrences between stimuli are registered, without any relational connection and validity. As such, this principle contradicts the view of the propositional account in which individuals form propositions about the relationship between the CS and US during the AC process (De Houwer, 2009). While research have provided evidence for this principle (e.g., Moran &

Bar-Anan, 2013), more recent research demonstrate that these AC effects only occur when a task is involved (e.g., request individuals to memorize co-occurrences about the CS and US) (Moran, Bar-Anan, & Nosek, 2015). Without such task, results suggest individuals may no longer encode these unqualified co-occurrences. Others (e.g., Hu, Gawronski, & Balas, 2017; Zanon, De Houwer, & Gast, 2012) have also attempted to test this principle and their findings are similar to Moran et al. (2015)'s findings. The second part of this principle suggests that AC forms direct links in memory between the CS and US, independent of their validity—the truth of the mental propositions about the CS-US pair. Research has failed to support this part of the principle. For example, one study pairs photographs of men with either positive descriptions (e.g., "Mike lent money to a friend in financial trouble") or negative descriptions (e.g., "Mike cheated during a poker game") (Peters & Gawronski, 2011). Feedback (i.e., "Right" or "Wrong") are given to individuals after they have guessed the accuracy of each description. In addition, individuals are informed that they should infer that the opposite is true when a description turns out to be false (i.e., a negative description that turns out to be false infer a positive evaluation). Results demonstrate that individuals' evaluations are impacted by the perceived validity of the pairing (e.g., "Mike lent money to a friend in financial trouble" remains as positive, even if the feedback given to individuals is "wrong"). Therefore, without its validity, the associative link between co-occurring stimuli cannot be formed.

The second principle suggests that AC creates associations once a stimulus with the response is elicited by another stimulus (i.e., stimulus-response; S-R learning). In general, this principle supports the first condition (i.e., AC operates without awareness of

the CS-US pairings). Support for S-R learning is typically claimed based upon the effects of AC found in individuals having no CS-US related memory (Corneille & Stahl, 2019). That is, individuals are unable to retrospectively recall the specific US that was paired with the CS. This is problematic because individuals' memory retention and retrieval phases may have impacted the memory encoding stage. Specifically, recallability occurs at a higher rate for more abstract high-level information, while low-level information may weaken the recallability rate (Brainerd & Reyna, 2002). In the context of AC, low-level information (e.g., specific details) of a US associated with a CS is less likely to be remembered, while more abstract high-level information (e.g., liking) is more likely to be remembered. If AC is based upon the information stored in memory, then AC effects would occur even when participants are unable to report specific details about the associated US.

In sum, there seems to be little evidence for AC's existence without contingency awareness and cognitive resources. Specifically, Corneille and Stahl (2019) are unable to find substantial evidence for an automatic association formation mechanism. Similar to Hofmann et al. (2010)'s findings, they conclude that effects of AC are often mediated by the propositional account.

AC as a Genuine Phenomenon

While research on AC's existence is compromised due to a lack of controls, there is evidence demonstrating that AC is a genuine phenomenon and acknowledged across different domains (De Houwer et al., 2005). On average, AC tends to yield a medium effect size (d = .52) (see Hofmann et al., 2010 for details). Some key moderators

influence the effects of AC. The awareness of CS-US contingency shows the largest effect of all moderators. In terms of moderators related to the sample, children tend to yield a smaller effect than adults, while pathological samples show the biggest effect. CS modality, such as visual, verbal, taste, or flavor, tend to show small or medium effect sizes, with verbal nonsensical being the largest. As for US modality, electrocutaneous stimulation (i.e., mild electric shock) yield the biggest effect. Among other findings, neutral CS show significantly bigger effects than non-neutral CS, for the supraliminal US than for the subliminal US, for explicit measures than for implicit measures.

Taken together, AC is a genuine phenomenon that seems to be explained by the propositional account—AC depends on a non-automatic formation and evaluation of propositions about the relationship between the CS and the US (De Houwer et al., 2005). This is important because the current research relies on the propositional account, which allows individuals to make sense of the CS-US relationship to produce Galatea effects. According to this view, the evaluation of the CS changes after individuals form the conscious proposition that the CS is associated with the US. As the propositional account suggests, AC is a conscious mental process, the effects of AC should depend highly on the awareness of CS-US contingency. While some research has suggested that AC may occur without individuals' awareness, both meta-analytical results and recent reviews have suggested the opposite is true, such that AC effects are bigger when individuals are aware of the stimuli and make propositions about the CS-US linkage.

Eliciting Galatea Effects via Associative Conditioning

Self-expectation is the key to eliciting Galatea effects. While traditional Galatea research has used deceptive verbal feedback to raise expectations, this research examines the Galatea process through AC. One prominent way of acquiring or changing individuals' conceptions is AC. For example, researchers have successfully changed individuals' conceptions of an initially neutral person by pairing this person (CS) with images of athletes or nonathletes (US) (Förderer & Unkelbach, 2011). Their results show that individuals are more likely to rate the initially neutral person more athletic when this person is paired with the image of an athlete than with the nonathlete. In another experiment, Förderer and Unkelbach (2014) demonstrate that, when brand logos (CS) are paired with celebrities who possess specific attributes (US) (e.g., humorous, sexy, educated, athletic, soft), individuals tend to rate brand logos similar to the celebrity's attributes (Unkelbach & Högden, 2019).

Likewise, individuals' self-schemas as a leader and follower can be changed via AC. In the leadership context, individuals' images (CS) (e.g., profile pictures) can be repetitively paired with positive leadership attributes (US) (e.g., dynamic, intelligent, helpful, dedicated) to elevate their overall leadership self-schemas. As individuals evaluate the proposition of these CS-US relationships (e.g., "me" and "dynamic," "me" and "helpful"), they are likely to internalize these positive leadership attributes. Once these attributes are internalized, individuals are likely to have a higher self-expectation as leaders, which then elicit Galatea effects. In the followership context, individuals' self-schemas of followership can be elevated when their images (CS) are paired with positive followership attributes (US) (e.g., hardworking, enthusiastic, loyal). As they evaluate the

proposition of the relationship between themselves (CS) and positive followership attributes (US) (e.g., “me” and “hardworking,” “me” and “enthusiastic,” “me” and “loyal”), they may then internalize these followership attributes. Once individuals have internalized these positive followership attributes, they may have a higher self-expectation as followers, which then elicit Galatea effects.

Hypotheses

Given the primary goal of this research is to develop self-directed Galatea interventions to enable individuals to enhance their positive leadership and followership self-schemas, I propose that individuals' self-schemas as leaders or followers may be enhanced by repetitively pairing an image of themselves (CS) with positive leadership or followership attributes (US). Through the pairing process, individuals may form propositions about themselves and positive leadership or followership attributes. Once individuals form a conscious proposition that those positive leadership or followership attributes are paired with themselves, such knowledge functions as a justification for determining their self-schemas as leaders or followers. A customized conditioning tool named TAPPIT[1] is used to pair participants with specific stimuli. As individuals internalize positive leadership or followership attributes from pairings, they are likely to have higher expectations of themselves as leaders or followers, that in turn, may trigger Galatea effects.

Enhancing Self-Schemas of Leadership. To test the plausibility of triggering Galatea effects by enhancing individuals’ self-schemas as leaders, I first use AC to condition individuals to associate themselves with positive leadership attributes, that is,

positive implicit leadership theories (PILTs; Lord, Foti, & De Vader, 1984; Lord & Maher, 1991). ILTs represent individuals' schemas of attributes that characterize leaders. According to the categorization theory (Lord, 1985), ILTs are used to categorize individuals into leaders and non-leaders because they serve as the standard for individuals to form an impression of leaders. Associating individuals with PILTs is likely to impact their self-schemas as leaders. Specifically, when individuals (CS) are associated with PILTs (US) (i.e., Sensitivity, Intelligence, Dynamism, Dedication), their self-schemas as leaders (CS) are likely to shift positively. Therefore, I hypothesize:

> ***Hypothesis 1.*** *Individuals conditioned to associate themselves with PILTs will rate themselves significantly more positively as leaders than those who are not conditioned to associate themselves with PILTs.*

PILTs and Leadership Self-Efficacy. In traditional Galatea interventions, self-efficacy is often manipulated to elicit Galatea effects (e.g., Eden & Kinnar, 1991; Eden & Zuk, 1995; McNatt & Judge, 2004). Although there is currently no Galatea intervention that focuses on leadership, leadership self-efficacy (LSE) should be relevant to Galatea effects based on previous findings. LSE refers to the self-perceived capabilities for performing tasks necessary to accomplish specific leadership roles effectively (Chemers, Watson, & May, 2000; Kane, Zaccaro, Tremble, & Masuda, 2002). That is, LSE is a specific form of efficacy beliefs that focus on individuals' competence in the leadership domain (Ng, Ang, & Chan, 2008), rather than a general form of efficacy beliefs that involve their overall competence in a wide range of situations (Eden & Kinnar, 1991). Drawing from existing findings on the relationship of personal attributes (e.g., personality

traits) and LSE (Ng et al., 2008), I predict that leadership attributes (i.e., ILTs) are also related to LSE. Specifically, when individuals' self-schemas as leaders become more positive due to AC, they should have higher LSE given that they have higher self-expectation as leaders (i.e., individuals who internalize more PILTs believe they have what it takes to be a good leader and perform tasks necessary to accomplish their leadership roles effectively). The activation of PILTs is likely to trigger corresponding expectations related to positive leadership schemas. As these self-schemas become more salient and activated through AC, they trigger associated conceptual representations. For example, activating the general concept of "me as a leader" may activate the associated notion of a dedicated leader. Moreover, individuals may form propositions about themselves and PILTs (De Houwer et al., 2005). For example, thinking about themselves being paired with PILTs may provide justifications for why they are good leaders. Through AC, the constant activation of these conceptual representations and formation of those propositions increase the tendency to behave in ways consistent with those beliefs. Individuals with more positive ILTs, then, may think and act more positively as leaders, triggering Galatea effects (Leung & Sy, 2018). Therefore, I hypothesize that:

Hypothesis 2. *Individuals conditioned to associate themselves with PILTs will report higher leadership self-efficacy than those in the control condition.*

PILTs and Motivation to Lead. Motivation to lead is an important variable to consider in Galatea leadership because it helps to assess whether individuals will be willing to put in the effort to fulfill leadership responsibilities (DeRue & Myers, 2014). Motivation to lead (MTL; Chan & Drasgow, 2001) refers to the desire to attain leadership

roles and expend effect to fulfill leadership role necessities. There are three types of MTL: affective-identity MTL (AFF-MTL; the degree to which individuals enjoy leadership roles and see themselves as leaders), social-normative MTL (SN-MTL; the degree to which individuals see leadership as a responsibility and duty), and non-calculative MTL (NC-MTL; the degree to which individuals see leadership opportunities positively despite potential costs). However, recent meta-analytic results suggest each dimension of MTL has a unique pattern of antecedents and are only modestly correlated. Hence, MTL should be operationalized as three distinct constructs rather than as one overarching motivational construct (Badura, Grijalva, Galvin, Owens, & Joseph, 2020). Precisely, AFF-MTL and SN-MTL capture overlapping *agentic* antecedents (e.g., core self-evaluation, general self-efficacy, individualistic values), while SN-MTL and NC-MTL capture overlapping *communal* antecedents (e.g., agreeableness, conscientiousness, collectivistic values). In general, AFF-MTL accounts for the greatest amount of unique variance in leadership outcomes except for SN-MTL, explaining the greatest amount of unique variance in transactional leadership. However, it should be noted that SN-MTL is also predictive of other leadership outcomes (e.g., leadership emergence, transformational leadership, leadership effectiveness), and AFF-MTL is often not a significantly stronger predictor of those outcomes compared to SN-MTL.

Given the key tenet of Galatea effects is self-expectation, enhancing PILTs should impact SN-MTL and AFF-MTL, but not NC-MTL, as SN-MTL and AFF-MTL are predicted by agentic antecedents. When individuals' self-schemas as leaders become more positive, they should have a higher expectation as leaders (i.e., individuals who

internalize more PILTs believe they have what it takes to be good leaders and are more willing to take on responsibilities to fulfill their leadership roles). In addition, because leader identity is a sub-component of individuals' self-concepts that include leadership schemas (Epitropaki et al., 2017), enhancing their PILTs should also impact the degree to which they enjoy leadership roles and their leader identity. Consistent with findings in the self-fulfilling prophecy literature (e.g., Eden & Zuk, 1995; McNatt & Judge, 2004), the key variable of interest has always been self-expectation (e.g., self-schemas), rather than cost/benefits of a leadership role. As such, NC-MTL should not be impacted. As such, I hypothesize:

Hypothesis 3. *Individuals conditioned to associate themselves with PILTs will report higher SN-MTL than those in the control condition.*

Hypothesis 4. *Individuals conditioned to associate themselves with PILTs will report higher AFF-MTL than those in the control condition.*

Hypothesis 5. *Individuals conditioned to associate themselves with PILTs will not report higher NC-MTL than those in the control condition.*

Enhancing Self-Schemas of Followership. Beyond leadership, it is important to consider examining Galatea effects in the followership domain. Leaders and leadership have often been romanticized and over-glorified. We are often captivated by who leaders are and what leaders do to impact organizational outcomes (Bligh, Kohles, & Pillai, 2011; Meindl, Ehrlich, & Dukerich, 1985). As such, researchers have called for more research examining followership and followership development (Riggio, 2014). While research has examined the followership process (e.g., Gardner, Avolio, Luthans, 2005;

Braun et al., 2017; Junker et al., 2016; Sy, 2010), only a few have examined self-fulfilling prophecy in the followership context (e.g., Leung & Sy, 2018). It is important to investigate followership in the context of self-fulling prophecy because followers' perceptions, such as their self-expectations, are vital to their performance (Sy, 2011) and behaviors at work (Carsten, Uhl-Bien, West, Patera, & McGregor, 2010). To this end, I test the plausibility of triggering Galatea effects by enhancing individuals' self-schemas as followers. Similar to the Galatea leadership intervention, I use AC to condition individuals to associate themselves with positive followership attributes, that is, positive implicit followership theories (PIFTs; Sy, 2010). IFTs represent individuals' schemas of attributes that characterize followers. While ILTs are used to categorize individuals into leaders or non-leaders, IFTs are used to categorize individuals into followers and non-followers. As such, associating individuals with PIFTs is likely to impact their self-schemas as followers. Specifically, when individuals (CS) are associated with PIFTs (US) (i.e., Industry, Good Citizen, Enthusiasm), their self-schemas as followers (CS) are likely to shift positively. Therefore, I hypothesize:

> ***Hypothesis 6.*** *Individuals conditioned to associate themselves with PIFTs will rate themselves significantly more positively as followers than those in the control condition.*

PIFTs and General Self-Efficacy. A key driver of Galatea effects or any self-fulfilling prophecy processes is self-efficacy. According to social cognitive theory (Bandura, 1986), self-efficacy has three dimensions: (a) level of task difficulty, (b) certainty of successfully performing a level of task difficulty, and (c) the extent to which

both the level of task difficulty and certainty of successfully performing a level of task difficulty generalize across situations (i.e., generality). While the notion of leadership self-efficacy has been established for almost 20 years (Chan & Drasgow, 2001), little is known about the corresponding notion of follower self-efficacy. Therefore, no measure uniquely captures self-efficacy in the followership domain. As such, I assess followers' general self-efficacy as it has often been used in research on Galatea effects.

Researchers have suggested that people have a trait-like generality dimension of self-efficacy, namely, *general self-efficacy* (GSE). GSE refers to individuals' beliefs in their overall competence to perform across various situations (Eden, 2001). Because followers are generalists who perform the broad duties assigned to them by their leaders, it is appropriate to examine whether PIFTs can impact GSE. When individuals' self-schemas as followers become more positive due to AC, they should have higher GSE given that they have higher self-expectation as followers (i.e., individuals who internalize more PIFTs believe they have what it takes to fulfill their followership roles effectively, across situations). The activation of PIFTs is likely to trigger corresponding expectations related to positive followership schemas. As these self-schemas become more salient and activated through AC, they trigger associated conceptual representations. For example, activating the general concept of "me as a follower" may activate the associated notion of an industrious follower. Through AC, the constant activation of these conceptual representations increases the tendency to behave in ways consistent with those beliefs. Individuals with more PIFTs, then, may think of themselves more positively as followers, triggering Galatea effects (Leung & Sy, 2018). Therefore, I hypothesize that:

Hypothesis 7. *Individuals conditioned to associate themselves with PIFTs will report higher GSE than those in the control condition.*

PIFTs and Personal Mastery. In addition to GSE, I also examine the relationship between PIFTs and *Personal Mastery* (PM). PM refers to individuals' sense of control in carrying out goals (Lachman & Weaver, 1998). As both PM and GSE denote beliefs about individuals' ability to achieve specific outcomes, they are likely to share similar antecedents. Although they may appear to be similar, they reflect different concepts. Specifically, GSE concerns the individuals' general performance (Chan, Gully, & Eden, 2001), whereas PM concerns individuals' sense of personal control over their performance (Lachman & Weaver, 1998). Research has shown that self-perceptions of subordinate rank and class are associated with a reduced sense of control (e.g., Kraus, Piff, & Keltner, 2009; Levenson, 1981). As such, followers who perceive themselves as inferior to others may have lower sense of control over their performance. Conversely, followers who see themselves as superior to others may have higher sense of control over their performance. The activation of PIFTs is likely to trigger related constructs, as such PM, via spread activation in the associative network (Fiske & Taylor, 1991). For example, activating individuals' positive self-schemas of followership is likely to activate a corresponding notion of "a reliable and productive follower." When PIFTs are activated via AC, individuals are likely to see themselves as superior (i.e., high on PIFTs) to other followers. As such, these followers are likely to have higher sense of control over their performance. Accordingly, I hypothesize that:

Hypothesis 8. *Individuals conditioned to associate themselves with PIFTs will report higher personal mastery than those in the control condition.*

Overview of Studies

A total of two studies are conducted to examine the plausibility of a self-directed Galatea intervention via AC. Study 1 served to investigate whether individuals can improve their self-schemas as leaders via AC, triggering Galatea effects to enhance their leadership self-efficacy and motivation to lead (Hypotheses 1 – 5). Study 2 served to investigate whether individuals can improve their self-schemas as followers via AC to trigger Galatea effects, improving their general self-efficacy and personal mastery (Hypotheses 6 – 8).

Study 1

The goal of Study 1 was to assess the plausibility of a self-directed Galatea leadership intervention. Specifically, I investigated whether individuals can enhance their self-schemas of a leader via AC to trigger Galatea effects to improve their LSE and MTL.

Study 1 Method

Participants

The sample consists of 160 undergraduate students recruited from the psychology research pool at the University of California in exchange for research credits. The student sample included 124 females (77%) and 36 males (23%). The ethnic composition was diverse: 67 (42%) were Asian American, 55 (34%) were Hispanic or Latino, 17 (10%) were "other," 16 (10%) were Caucasian, four (3%) were African American, and one (1%) was Hawaiian/Pacific Islander. 54% were Freshmen, 24% were Sophomores, 14% were

Juniors, and 8% were Seniors. On average, participants were 19.21 (*SD* = 2.32) years old. Participants were randomly assigned to either the experimental (n = 80) or the control (n = 80) conditions.

TAPPIT

A game application, TAPPIT[1] (Sy, 2020), was used as part of the experiment to change individuals' self-schemas via AC. TAPPIT was designed to be a self-directed conditioning tool for users as it can be installed and used on mobile or tablet devices. Because TAPPIT allows individuals to upload a variety of stimuli, they can administer any form of AC with any US and CS. TAPPIT was set up as a memory game in which users are asked to memorize specific stimuli in the correct sequence. Stimuli are displayed in random orders in every trial, and users are asked to identify a specific stimulus after observing each sequence. In general, it takes about 2 minutes to complete five trials. TAPPIT becomes more challenging as the trial progress (i.e., longer sequences). Users are rewarded for faster and accurate responses. For a more detailed description of the gameplay, see Figure 2.

For the experimental condition, participants' photos were used as the CS and positive leadership attributes (i.e., PILTs) were used as the US. As for the control condition, participants' photos were used as the CS and neutral words such as table, desk, and case were used as the US. I deliberately used neutral words that are not positively or negatively associated with leadership schemas. Moreover, I avoided using words that describe human characteristics to ensure individuals in the control condition do not associate themselves with words that may change their self-schemas during the trials.

Even neutral words that describe human characteristics may change individuals' self-schemas. For example, associating participants with words such as "normal," "average," and "ordinary" may elicit Galatea and Golem effects. If individuals have a general negative self-view, pairing them with words such as "normal," "average," and "ordinary" may elevate their self-schemas, eliciting Galatea effects. Conversely, if individuals have a general positive self-view, pairing them with the same set of words would elicit Golem effects. Golem effects refer to negative effects such that lower expectations often lead to negative outcomes (Babad et al., 1982). As such, it is more appropriate to use neutral words that do not describe human characteristics as the US in the control condition.

Procedures

Before arriving to the laboratory experiment, participants were instructed to complete a $Time_1$ survey to assess their baseline of PILTs, LSE, SN-MTL, AFF-MTL, and NC-MTL. Participants were assigned to a computer and a smartphone when they arrived at the laboratory. For the first part of the laboratory experiment, participants were instructed to play a version of the game, TAPPIT. This version of TAPPIT allowed participants to take and upload pictures of themselves to serve as the CS, while the US had already been uploaded prior to their laboratory visits. Participants were asked not to show any facial expression (e.g., not smiling, frowning, laughing) to ensure the results are due to the US manipulation rather than the positive or negative valence produced from any types of positive or negative emotion. Additionally, they were asked to remove their hats or head covering unless those items were worn daily for religious purposes to ensure they can recognize themselves during the trials. In the experimental condition,

participants played TAPPIT with a picture of themselves (i.e., the CS), four positive dimensions of ILTs (i.e., Sensitivity, Dedication, Dynamism, and Intelligence), and thirteen PILTs attributes (i.e., Helpful, Understanding, Sincere, Intelligent, Educated, Clever, Knowledgeable, Dedicated, Motivated, Hardworking, Energetic, Strong, and Dynamic) that make up the four positive dimensions of ILTs (i.e., the US). While those words were shown to participants randomly, photos of themselves were shown to them in every trial to ensure their photos were repeatedly paired with positive leadership attributes (i.e., PILTs) in every trial. In the control condition, participants played TAPPIT with a picture of themselves and words with no positive or negative meaning to leadership or human characteristics (e.g., table, patch, case). The length and protocol of AC trials vary across experiments (Hofmann et al., 2010); however, the length of each experiment is typically short (< 100 trials) (Franklin et al., 2016). In this experiment, participants in both conditions were instructed to play TAPPIT for 20 minutes (~50 trials). Upon completing the TAPPIT engagement, participants were instructed to complete a Time 2 survey on their assigned computer in the laboratory. See Appendix C for more detailed study instructions.

Measures

Positive Implicit Leadership Theories (PILTs). Participants' positive leadership schemas were measured with the thirteen positive attributes from the ILTs scale (Epitropaki & Martin, 2004). Participants were asked to rate on a scale of 1 (not at all characteristic) to 10 (extremely characteristics) the extent to which each item was characteristic of them as leaders. The PILTs scale consisted of four positive dimensions

(i.e., Sensitivity, Dedication, Dynamism, and Intelligence) with thirteen items: helpful, understanding, sincere, intelligent, educated, clever, knowledgeable, dedicated, motivated, hardworking, energetic, strong, and dynamic. Cronbach's alphas were .86 (Time 1) and .92 (Time 2).

Leadership Self-Efficacy. Participants' leadership self-efficacy was assessed using a five-item measure developed by Chan and Drasgow (2001). Participants rated on a seven-point scale the extent to which they disagree or agree with each statement (1 = strongly disagree, 7 = strongly agree). Example items included "I feel confident that I can be an effective leader in most of the groups that I work with," "I am not confident that I can lead others effectively," and "I can use my leadership skills to deal effectively with any situation." Cronbach's alphas were .88 (Time 1) and .90 (Time 2).

Social-Normative Motivation to Lead (SN-MTL). Participants' SN-MTL was measured with three items from Chan and Drasgow's (2001) motivation to lead scale. Participants were asked to rate on a seven-point scale the extent to which they disagree or agree with each statement (1 = strongly disagree, 7 = strongly agree). Items included, "I feel I have a duty to lead others if I am asked," "I agree to lead whenever I am asked or nominated by the other members," and "I was taught to believe in the value of leading others." Cronbach's alphas were .80 (Time 1) and .80 (Time 2).

Affective-Identity Motivation to Lead (AFF-MTL). Participants' AFF-MTL was measured with three items from Chan and Drasgow's (2001) motivation to lead scale. Participants were asked to rate on a seven-point scale the extent to which they disagree or agree with each statement (1 = strongly disagree, 7 = strongly agree). Items

included "Most of the time, I prefer being a leader rather than a follower when working in a group," "I usually want to be the leader in the groups that I work in," and "I have a tendency to take charge in most groups or teams that I work in." Cronbach's alphas were .92 (Time 1) and .91 (Time 2).

Non-Calculative Motivation to Lead (NC-MTL). Participants' NC-MTL was measured with three items from Chan and Drasgow's (2001) motivation to lead scale. Participants were asked to rate on a seven-point scale the extent to which they disagree or agree with each statement (1 = strongly disagree, 7 = strongly agree). Items included "I am only interested to lead a group if there are clear advantages for me," "I would want to know what's in for me if I am going to agree to lead a group," and "I never expect to get more privileges if I agree to lead a group." Cronbach's alphas were .57 (Time 1) and .74 (Time 2). Although $Time_1$'s alpha is below the universal standard of .70, researchers have clarified the misconception that alpha should be above or equal to .70. The standard of .70 was derived from Nunnally's personal intuition, rather than logical reasoning or results from research (Cho & Kim, 2015). No evidence has shown that an alpha of .70 is a better standard than .69 or .71. In some cases, researchers consider an alpha of .50 or .60 to be sufficient, especially in exploratory research (Nunnally, 1967). Because the current study only uses three items from the original nine-item scale, the alpha will increase as the number of items increases. The increased alpha value from $Time_1$ to Time 2 may be due to participants' familiarity with the items as they become more familiar with the study and measures in Time 2. In addition, it is possible that the higher alpha value in Time 2 is partly due to the experimental environment. Participants tend to pay

more attention and be less distracted when they are completing the study in an experimental setting.

Study 1 Results

Means and standard deviations of PILTs, LSE, SN-MTL, AFF-MTL, and NC-MTL in both Time 1 and Time 2 are shown in Table 1. Correlations among all study variables are shown in Table 2.

Baseline Analysis

No significant difference emerged between participants who were assigned to the experimental condition ($M = 7.39$, $SD = .96$) and participants who were assigned to the control condition ($M = 7.34$, $SD = .72$), $t(158) = .05$, $p = .69$, indicating that random assignment was successful.

Hypothesis Testing

To examine whether participants' PILTs ratings have changed due to their conditions, I regressed participants' Time 2 PILTs ratings on their conditions (1 = experimental, 0 = control) while controlling for their Time 1 PILTs ratings. Results of the multiple regression model were significant, $F(2, 157) = 144.4$, $p < .001$, $R^2 = .64$), indicating that approximately 64% of the variance in participants' Time 2 PILTs ratings is explained by their Time 1 PILTs ratings and Condition (see Table 3). After controlling for participants' Time 1 PILTs ratings, participants' condition significantly predicted their Time 2 PILTs ratings, $b = .34$, 95% CI = [.16, .51], $p < .001$. This suggests that participants who played the version of TAPPIT that paired their photos with PILTs

attributes rated themselves higher on PILTs than those who played the control version of TAPPIT that included their photos and neutral words unrelated to leadership.

Next, I used the same approach to examine whether there were any changes in participants' LSE due to their conditions. I regressed participants' Time 2 LSE on their conditions (1 = experimental, 0 = control) while controlling for their Time 1 LSE. Results of the multiple regression model were significant, $F(2, 157) = 203.4$, $p < .001$, $R^2 = .72$, indicating that approximately 72% of the variance in participants' Time 2 LSE is explainable by their Time 1 LSE and condition (see Table 3). After controlling for participants' Time 1 LSE ratings, participants' condition marginally predicted their Time 2 LSE ratings, $b = .18$, 95% CI = [-.01, .37], $p = .068$. This suggests that participants who played the version of TAPPIT that paired their photos with PILTs attributes rated themselves slightly higher on LSE than those who played the control version of TAPPIT that included their photos and neutral words unrelated to leadership.

Next, I tested whether participants' SN-MTL would change due to their conditions. Using a multiple regression model, I regressed participants' Time 2 SN-MTL on their conditions (1 = experimental, 0 = control) while controlling for their Time 1 SN-MTL. Results of the multiple regression model were significant, $F(2, 157) = 121.6$, $p < .001$, $R^2 = .61$, suggesting that approximately 61% of the variance in participants' Time 2 SN-MTL is explainable by their Time 1 SN-MTL and condition (see Table 3). After controlling for participants' Time 1 SN-MTL, participants' condition significantly predicted their Time 2 SN-MTL, $b = .33$, 95% CI = [.11, .56], $p = .004$. This suggests that

participants in the experimental condition were more motivated to lead due to their sense of responsibility and duty than those in the control condition.

I then tested whether participants' AFF-MTL would change due to their conditions. Using a multiple regression model, I regressed participants' Time 1 AFF-MTL on their conditions (1 = experimental, 0 = control) while controlling for their Time 1 AFF-MTL. Results of the multiple regression model were significant, $F(2, 157) = 234.3$, $p < .001$, $R^2 = .75$, suggesting that approximately 75% of the variance in participants' Time 2 AFF-MTL is explainable by their Time 1 AFF-MTL and condition (see Table 3). After controlling for participants' Time 1 AFF-MTL, participants' condition did not predict their Time 2 AFF-MTL, $b = -.03$, 95% CI = [-.24, .18], $p = .754$. Contrary to my prediction, results suggest that the degree to which participants enjoy being in leadership roles and see themselves as leaders did not differ between the experimental and control condition.

Lastly, I tested whether participants' NC-MTL would change due to their conditions. I regressed participants' $Time_2$ NC-MTL on their conditions (1 = experimental, 0 = control) while controlling for their $Time_1$ NC-MTL. Results of the multiple regression model were significant, $F(2, 157) = 75.87$, $p < .001$, $R^2 = .49$, suggesting that approximately 49% of the variance in participants' Time 2 NC-MTL is explainable by their Time 1 NC-MTL and condition (see Table 3). After controlling for participants' $Time_1$ NC-MTL, participants' condition did not predict their Time 2 NC-MTL, $b = -.04$, 95% CI = [-.33, .26], $p = .803$. As expected, the degree to which

participants view leadership opportunities positively despite costs/benefits did not differ between the experimental and control condition.

Exploratory Analyses

Mediation Models

In addition to examining whether AC can be used as a tool to shape individuals' PILTs and their relevant outcomes (Hypotheses 1 – 5), I also tested the indirect effect of participants' ILTs on their SN-MTL, mediated through LSE similar to the traditional Galatea model.

Mediation analyses are often guided by Baron and Kenny's (1986) four-step approach. Step 1 is to show that *X* is related to *Y* by examining the relationship between the two (coefficient *c*). Step 2 is to show that *X* is associated with M by examining the relationship between the two (coefficient *a*). Step 3 should show that *M* is related to *Y* while holding X constant, which involves estimating the *b* path of the mediation model. Step 4 involves estimating and testing path *c′* to determine whether an indirect effect exists. While Baron and Kenny's (1986) guide is influential and widely cited, researchers have questioned the necessity of estimating the relationship in Step 1 (i.e., showing *X* is related to *Y*) (MacKinnon, 2000; MacKinnon, Krull, & Lockwood, 2000; Shrout & Bolger, 2002). Shrout and Bolger (2002) suggest that as the causal process becomes more distal, the effect size reduces because the more distal an effect gets, it likely is (1) conveyed through additional paths in the causal chain, (2) due to competing causes, and (3) due to random factors. The test of the *X* and *Y* causal process may be more powerful when mediation is considered. The indirect effect between *X* and *Y* benefits when the

proximity of $X \rightarrow M$ and $M \rightarrow Y$ relationships are larger than the distal $X \rightarrow Y$ relationship. When the effect size of $X \rightarrow M$ path is large, the multicollinearity of the two variables causes the standard error for $\hat{b}$ to increase. This, in turn, can reduce the indirect effect. However, in a case where there is a medium effect of $X \rightarrow M$, the indirect effect will be more powerful. Therefore, Shrout and Bolger (2002) recommend moving forward to Baron and Kenny's (1986) Step 2 if there's a strong theoretical background even when the relationship between X and Y is insignificant.

Other researchers who have recommended dropping Baron and Kenny's (1986) first step of their multi-step approach had a different reason than Shrout and Bolger (2002). MacKinnon and colleagues (MacKinnon, 2000; MacKinnon et al., 2000) considered suppression effects when the indirect path a x b has the opposite sign of the direct effect c'. Such models are known as 'inconsistent mediation models.' (Davis, 1985). When a suppression effect is hypothesized, the indirect path a x b is still considered meaningful and should proceed with the normal regression methods and bootstrap techniques, while the direct effect c' should be interpreted as a conditional effect. Even when a suppression effect is not hypothesized, its results can still be observed empirically.

To this end, Shrout and Bolger (2002) provided a schematic decision tree for assessing the mediation model, taking the strength of the effect to be mediated (proximal vs. distal) and the possibility of suppression effects into account. According to this schematic decision tree, Step 1 requires one to think conceptually about the nature of the study and the effect size to be mediated. If the $X \rightarrow Y$ effect is proximal, one should

estimate the bivariate *X* → *Y* path (i.e., path *c*) as Baron and Kenny (1986) had suggested. If the *X* → *Y* effect is more distal and the expected effect is small, one can bypass Baron and Kenny's (1986) Step 1 and (a) estimate the bivariate path of *X* and *M* (i.e., path *a*), (b) estimate the *M* → *Y* path while holding *X* → *Y* constant (i.e., path *b*), (c) estimate the indirect path of *X* → *M* → *Y* (i.e., *a* x *b*), and (d) estimate *X* → *Y* path holding *M* → *Y* constant (path *c′*). If there is strong evidence that direct path, *c′*, has an opposite sign as indirect path *a* x *b*, then it is an indication of suppression effects. If not, one can assess the strength of mediation using effect ratio.

Bootstrapping analysis is a popular method of estimating the indirect effect of a mediation model (Shrout & Bolger, 2002). It is a non-parametric method that relies on resampling with replacement (e.g., 10000 times) and does not assume that indirect effect is normally distributed (MacKinnon, Lockwood, & Williams, 2004). This process bootstraps the sampling distribution of the indirect effect and computes the confidence intervals of the true population of the effect. If zero is not included as part of the intervals, one can be confident that the indirect effect is different from zero. I generated bias-corrected and accelerated confidence intervals for the indirect effect. Indirect effects with 95% confidence intervals, excluding zero, indicate a significant indirect effect at $\alpha = .05$, supporting the mediation. If *X* no longer affects *Y* after controlling for *M* (i.e., path c′ equal or close to zero), it is a complete mediation. If the *X* → *Y* is reduced in size but is still different from zero, it is a partial mediation.

A total of six mediation analyses were conducted to show whether LSE mediates the relationship between PILTs and SN-MTL. The indirect effect in all six models was

conducted using bootstrapping procedures and was computed for each of the 10,000 bootstrapped samples. The results of mediation analyses can be seen in Table 4.

The first model consisted of all participants' Time 2 ratings of PILTs, LSE, and SN-MTL. As can be seen in Figure 3, the coefficients for PILTs and LSE (path a = .61) and LSE and SN-MTL (path b = .42) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (ab = .26). As PILTs was no longer a significant predictor of SN-MTL (c' = .13) when LSE was included in the equation, I can conclude that LSE fully mediated the relationship between PILTs and SN-MTL. I conducted two additional mediation analyses using participants' Time 2 ratings.

In the second model, I included only Time 2 ratings of participants in the experimental condition. As can be seen in Figure 4, the coefficients for PILTs and LSE (path a = .66) and LSE and SN-MTL (path b = .40) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (ab = .27). As PILTs was no longer a significant predictor of SN-MTL (c' = .16) when LSE was included in the equation, this suggested that LSE fully mediated the relationship between PILTs and SN-MTL.

In the third model, I included only Time 2 ratings of participants in the control condition (see Figure 5). Similar to Models 1 and 2, the coefficients for PILTs and LSE (path a = .53) and LSE and SN-MTL (path b = .50) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (ab = .26). As PILTs was no longer a significant predictor of

SN-MTL (c' = .00) when LSE was included in the equation, results suggested that LSE fully mediated the relationship between PILTs and SN-MTL.

Using the same method, I conducted a mediation analysis consisting of all participants' Time 1 ratings of PILTs, LSE, and SN-MTL. Overall, the results are very similar to Models shown above (see Figure 6). The coefficients for PILTs and LSE (path a = .70) and LSE and SN-MTL (path b = .42) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (ab = .30). As PILTs was no longer a significant predictor of SN-MTL (c' = .07) when LSE was included in the equation, results suggested that LSE fully mediated the relationship between PILTs and SN-MTL.

In Model 5, I included only Time 1 ratings of participants in the experimental condition. As can be seen in Figure 7, the coefficients for PILTs and LSE (path a = .72) and LSE and SN-MTL (path b = .50) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (ab = .36). As PILTs was no longer a significant predictor of SN-MTL (c' = .01) when LSE was included in the equation, this suggested that LSE fully mediated the relationship between PILTs and SN-MTL.

In the third model, I included only Time 1 ratings of participants in the control condition (see Figure 8). Similar to Models shown above, the coefficients for PILTs and LSE (path a = .67) and LSE and SN-MTL (path b = .32) are consistent with my hypothesis that individuals' PILTs can elicit Galatea effects that impact their LSE that, in turn, influence their SN-MTL (path ab = .22). As PILTs was no longer a significant

predictor of SN-MTL ($c' = .13$) when LSE was included in the equation, results suggested that LSE fully mediated the relationship between PILTs and SN-MTL.

Altogether, results from all six mediation models provided strong evidence that PILTs are keys to eliciting Galatea effects. Increasing individuals' PILTs can improve LSE, which then increases the likelihood of their SN-MTL. However, it should be noted that while all six mediation models supported the traditional Galatea pathway (i.e., self-expectation → motivation), our primary analysis showed that the Galatea leadership intervention had a bigger impact on SN-MTL than LSE. Unlike previous Galatea interventions, this finding suggested the activation of Galatea effects do not necessarily rely on self-efficacy. Rather, individuals can be conditioned to be motivated to lead when their self-expectation as leaders (i.e., PILTs) is elevated.

Study 1 Discussion

Overall, results in Study 1 support the idea that AC can be used for a self-directed Galatea leadership intervention. Galatea effects occur when self-expectation is enhanced, resulting in desirable outcomes (Eden, 1984). While this study does not test the full Galatea pathway (i.e., Self-Expectation → Motivation → Performance), it provides evidence that self-expectation as leaders can be enhanced with PILTs, which in turn, impact LSE and SN-MTL. PILTs represent individuals' self-schemas as leaders and serve as sensemaking mechanisms (Weick, 1995) that influence how they see themselves in the leadership domain (Hannah et al. 2009). Results indicate that AC has a positive impact on individuals' self-schemas as leaders; that is, individuals in the experimental condition internalize PILTs to be a part of their self-schemas as leaders, triggering Galatea effects.

As such, this study shows that PILTs can serve as proxies for leader self-expectation that trigger Galatea effects. Consistent with my prediction, enhancing individuals' self-schemas as leaders can impact their sense of duty and responsibilities (i.e., SN-MTL) as they feel they are capable of fulfilling leadership roles. In addition, NC-MTL did not differ across conditions because changing how individuals see themselves as leaders does not necessarily impact whether they would benefit from the role. Contrary to my prediction, AFF-MTL did not differ across conditions. Because AFF-MTL consists of two components (i.e., the degree to which individuals enjoy leadership roles and see themselves as leaders), it is possible that the items used for this study only taps into the affective component (i.e., "Most of the time, I prefer being a leader rather than a follower when working in a group," "I usually want to be the leader in the groups that I work in," and "I have a tendency to take charge in most groups or teams that I work in"). This null finding may also be due to the undergraduate sample. As Epitropaki et al. (2017) defines leader identity as "a sub-component of one's working self-concept that includes leadership schemas, leadership experiences and future representations of oneself as a leader." (p.107), undergraduate students participated in this study may lack the leadership experience needed to refine their leader identity. Therefore, future research should replicate this study with a worker sample and the full nine-item AFF-MTL measure.

In addition, mediation analyses show PILTs may serve as an antecedent of LSE, that in turn, impact SN-MTL. While results support this model, the intervention seems to have a more significant impact on SN-MTL than LSE. This is an interesting finding as it deviates from the traditional Galatea model in which self-efficacy always plays a vital

role in motivation. Results from this study suggest that the effects of Galatea leadership do not necessarily involve self-efficacy, such that SN-MTL can be enhanced with PILTs.

Study 2

The goal of Study 2 was to assess the plausibility of a self-directed Galatea followership intervention. Specifically, I investigated whether individuals can improve their self-schemas of followers via AC to trigger Galatea effects to improve their general self-efficacy and personal mastery.

Study 2 Method

Participants

The sample consists of 160 undergraduate students recruited from the psychology research pool at the University of California in exchange for research credits. The student sample included 100 females (63%) and 60 males (37%). The ethnic composition was diverse: 62 (39%) were Asian American, 61 (38%) were Hispanic or Latino, 16 (10%) were Caucasian, 12 (7%) were "other," five (3%) were African American, and 4 (3%) were Hawaiian/Pacific Islander. On average, participants were 19.19 (*SD* = 1.41) years old. 50% were Freshmen, 21% were Sophomores, 21% were Juniors, and 8% were Seniors. Participants were randomly assigned to either the experimental (n = 80) or the control (n = 80) conditions.

Procedures

Before arriving at the laboratory experiment, participants were instructed to complete a $Time_1$ survey to assess their baseline for variables of interests. Participants were assigned to a computer and a smartphone when they arrived at the laboratory. For

the first part of the laboratory experiment, participants were instructed to play a version of the game, TAPPIT. This version of TAPPIT allowed participants to take and upload pictures of themselves to be the conditional stimulus, while the unconditional stimuli had already been uploaded prior to their laboratory visits. Participants were asked not to have any facial expressions (e.g., not smiling, frowning, laughing). Like in Study 1, they were asked to remove their hats or head covering unless those items were worn daily for religious purposes. In the experimental condition, participants played TAPPIT with a picture of themselves and three positive IFTs dimensions (i.e., Industry, Good Citizen, Enthusiasm) and nine positive IFTs attributes (i.e., Hardworking, Productive, Goes-above-and-beyond, Excited, Outgoing, Happy, Loyal, Reliable, Team player). In the control condition, participants played TAPPIT with a picture of themselves and neutral words that had no positive or negative meaning to followership (e.g., table, patch, case). Participants in both conditions were instructed to play TAPPIT for 20 minutes (~50 trials). Upon completion of the TAPPIT engagement, participants were asked to complete a Time 2 survey in the laboratory.

Measures

Positive Implicit Followership Theories (PIFTs). Participants' self-schemas as followers were measured with the nine positive attributes from the IFTs scale (Sy, 2010). Participants were asked to rate on a scale of 1 (not at all characteristic) to 10 (extremely characteristics) the extent to which each item was characteristic of them as followers. The IFTs scale consisted of three positive dimensions (i.e., Industry, Good Citizen, Enthusiasm) with nine items: hardworking, goes-above-and-beyond, productive, loyal,

reliable, team player, excited, outgoing, and happy. Cronbach's alphas were .82 (Time 1) and .86 (Time 2).

General Self-Efficacy. Participants' GSE was measured with the New General Self-Efficacy scale (NGSE) (Chen, Gully, & Eden, 2001). Participants were asked to rate on a five-point scale the extent to which they disagree or agree with each statement (1 = strongly disagree, 5 = strongly agree). The measure consisted of eight items. Example items included "I will be able to achieve most of the goals that I have set for myself," "When facing difficult tasks, I am certain that I will accomplish them," and "Even when things are tough, I can perform quite well." Cronbach's alphas were .88 (Time 1) and .91 (Time 2).

Personal Mastery. Participants' PM was measured with a four-item scale developed by Lachman and Weaver (1998). Items included: "I can do just about anything I really set my mind to," "When I really want to do something, I usually find a way to succeed at it," "Whether or not I am able to get what I want is in my own hands," and "What happens to me in the future mostly depends on me." Participants indicated the extent to which each of these statements described them using a seven-point scale (1 = strongly disagree, 7 = strongly agree). Cronbach's alphas were .82 (Time 1) and .83 (Time 2).

Study 2 Results

Means and standard deviations of PIFTs, GSE, and PM in both Time 1 and Time 2 are shown in Table 5. Correlations among all study variables are shown in Table 6.

Baseline Analysis

First, I assessed whether there was a significant difference in PIFTs Time 1 scores between conditions. Results showed no significant differences between participants who were assigned to the experimental condition (M = 7.32, SD = 1.26) and participants who were assigned to the control condition (M = 7.31, SD = 1.15), $t(158) = .07$, $p = .94$, suggesting that random assignment was successful.

Hypothesis Testing

To examine whether participants' PIFTs ratings have changed due to playing TAPPIT, I regressed participants' Time 2 PIFTs ratings on their conditions (1 = experimental, 0 = control) while controlling for their Time 1 PIFTs ratings. Results of the multiple regression model were significant, $F(2, 157) = 204.3$, $p < .001$, $R^2 = .72$ (see Table 7), indicating that approximately 72% of the variance in participants' Time 2 PIFTs ratings is explainable by their Time 1 PIFTs ratings and condition. After controlling for participants' Time 1 PIFTs ratings, participants' condition significantly predicted their Time 2 PIFTs ratings, $b = .45$, 95% CI = [.26, .64], $p < .001$. This suggests that participants who played the version of TAPPIT that paired their photos with PIFTs attributes rated themselves more positively than those who played the control version of TAPPIT that included their photos and neutral words that were unrelated to followership.

Next, I used the same approach to examine whether there were any changes in participants' GSE due to TAPPIT. I regressed participants' $Time_2$ GSE on their conditions (1 = experimental, 0 = control) while controlling for their $Time_1$ GSE. Results of the multiple regression model were significant, $F(2, 157) = 278.7$, $p < .001$, $R^2 = .78$ (see Table 7), indicating that approximately 78% of the variance in participants' $Time_2$

GSE is explainable by their $Time_1$ GSE and Condition. After controlling for participants' $Time_1$ GSE, participants' condition significantly predicted their $Time_2$ GSE, $b = .20$, 95% CI = [.10, .30], $p < .001$. This suggests that participants who played the version of TAPPIT that included their photos and PIFTs attributes had higher GSE than those who played the control version of TAPPIT that included their photos and neutral words that were unrelated to followership.

I then tested whether participants' PM would change due to the variations of TAPPIT. Using a multiple regression model, I regressed participants' $Time_2$ PM on their conditions (1 = experimental, 0 = control) while controlling for their $Time_1$ PM. Results of the multiple regression model were significant, $F(2, 157) = 199.7$, $p < .001$, $R^2 = .72$ (see Table 7), suggesting that approximately 72% of the variance in participants' $Time_2$ PM is explainable by their $Time_1$ PM and condition. After controlling for participants' $Time_1$ PM, participants' condition significantly predicted their $Time_2$ PM, $b = .19$, 95% CI = [.02, .37], $p = .030$. This suggests that participants who played the version of TAPPIT that included their photos and PILTs attributes had higher PM than those who played the control version of TAPPIT that included their photos and neutral words that were unrelated to followership.

Exploratory Analyses

Mediation Models

A total of six mediation analyses were conducted to show whether GSE mediates the relationship between PIFTs and PM. While PM is generally not a key variable in the self-fulfilling prophecy process, it is possible that individuals' sense of control over their

performance is predicted by their overall competence to perform across various situations. The indirect effect in all six models was conducted using bootstrapping procedures and was computed for each of the 10,000 bootstrapped samples. The results of mediation analyses can be seen in Table 8.

The first model consisted of all participants' Time 2 ratings of PIFTs, GSE, and PM. As can be seen in Figure 9, the coefficients for PIFTs and GSE (path a = .31) and GSE and PM (path b = 1.06) are consistent with my hypothesis that individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (ab = .33). As PIFTs was no longer a significant predictor of PM (c' = .07) when GSE was included in the equation, I can conclude that GSE fully mediated the relationship between PIFTs and PM. I conducted two additional mediation analyses using participants' Time_2 ratings.

In the second model, I included Time 2 ratings of participants in the experimental condition. As can be seen in Figure 10, the coefficients for PIFTs and GSE (path a = .32) and GSE and PM (path b = .98) are consistent with my hypothesis that individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (ab = .31). As PIFTs was no longer a significant predictor of PM (c' = .10) when GSE was included in the equation, this suggested that GSE fully mediated the relationship between PIFTs and PM.

In the third model, I included Time 2 ratings of participants in the control condition (see Figure 11). Similar to Models 1 and 2, the coefficients for PIFTs and GSE (path a = .29) and GSE and PM (path b = 1.14) are consistent with my hypothesis that

individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (*ab* = .33). As PIFTs was no longer a significant predictor of PM (*c′* = .05) when GSE was included in the equation, results suggested that GSE fully mediated the relationship between PIFTs and PM.

Using the same method, I conducted a mediation analysis consisted of all participants' Time 1 ratings of PIFTs, GSE, and PM. Overall, the results are very similar to models shown above (see Figure 12). The coefficients for PIFTs and GSE (path *a* = .20) and GSE and PM (path *b* = .89) are consistent with my hypothesis that individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (*ab* = .18). As PIFTs was no longer a significant predictor of PM (*c′* = .12) when GSE was included in the equation, results suggested that GSE fully mediated the relationship between PIFTs and PM.

In Model 5, I included Time 1 ratings of participants in the experimental condition. As can be seen in Figure 13, the coefficients for PIFTs and GSE (path *a* = .27) and GSE and PM (path *b* = .86) are consistent with my hypothesis that individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (*ab* = .23). As PIFTs was no longer a significant predictor of PM (*c′* = .14) when GSE was included in the equation, this suggested that GSE fully mediated the relationship between PIFTs and PM.

In the last model, I included Time 1 ratings of participants in the control condition (see Figure 14). Similar to models shown above, the coefficients for PIFTs and GSE (path *a* = .12) and GSE and PM (path *b* = .91) are consistent with my hypothesis that

individuals' PIFTs can elicit Galatea effects that impact their GSE that, in turn, influence their PM (path *ab* = .11). As the indirect path between PIFTs and PM (*c*' = .11) included 0, this suggested that GSE does not mediate the relationship between PIFTs and PM.

While results from five of the six mediation models provided strong evidence that GSE mediates the relationship between PIFTs and PM, GSE and PM are both very similar in terms of their definitions and statistical relationship. GSE concerns individuals' general performance (Chan, Gully, & Eden, 2001), whereas PM concerns individuals' sense of personal control over their performance (Lachman & Weaver, 1998). The correlation between the two variables varies between .57 and .72. In traditional Galatea research, PM is often not considered as part of the Galatea pathway. As such, more research is needed to examine whether the two should be treated as one variable or two distinct variables. While the distinction between the two variables is debatable, PM may serve as GSE's antecedent as perceived controllability may impact individuals' self-efficacy (Bandura & Wood, 1989). As such, it is possible that PM mediates the relationship between PIFTs and GSE, rather than GSE mediates the relationship between PIFTs and GSE. Given this rationale, future research should consider adding PM to the Galatea pathway.

Study 2 Discussion

Overall, results in Study 2 support the idea that AC can be used for a self-directed Galatea followership intervention. While this study does not test the full Galatea pathway, it provides evidence that self-expectation as followers can be enhanced with PIFTs via AC, which in turn, impact GSE and PM. PIFTs represent individuals' self-

schemas as followers and serve as sensemaking mechanisms (Weick, 1995) that influence how they see themselves in the followership domain. Results indicate that AC has a positive impact on individuals' self-schemas as followers, that is, those in the experimental condition internalize PIFTs to be a part of their self-schemas as followers, triggering Galatea effects. Consistent with previous findings on IFTs (e.g., Leung & Sy, 2018; Whiteley et al., 2012), this study shows that PIFTs can serve as proxies for follower self-expectation that trigger Galatea effects.

General Discussion

The overarching purpose of this research was to develop a self-directed Galatea intervention via Associative Conditioning (AC). This research served among the first to examine the notions of Galatea leadership and followership. While decades of research have dedicated to Pygmalion leadership, little is known about Galatea leadership. This research showed that leader self-expectations can be elevated when individuals associate themselves with PILTs via AC. Going beyond leadership, this research also address the need to examine how followers may develop their positive followership expectations. Specifically, I demonstrated that follower self-expectations can be elevated as individuals associate themselves with PIFTs via AC. Findings from this research is important as they paved the way for future research to examine the developmental process of Galatea leaders and followers and its implications for team and organizational outcomes.

Unlike previous research on Galatea effects, this research demonstrated that Galateas can be self-made, rather than relying on others to facilitate the self-fulfilling prophecy process. More importantly, this research did not involve deceptions of any kind.

This is a significant contribution to the self-fulfilling prophecy literature because traditional self-fulfilling prophecy experiments often deployed deceptions to create a false expectation to boost performance. Deception is problematic because it raises ethical concerns on whether it is acceptable to intentionally deceive individuals about their performance, especially in real world settings. To elicit Galatea effects that are sustainable in real world settings, deceptions should not be deployed to enhance positive self-expectations. In this research, however, positive leadership and followership schemas were used as stimuli to allow individuals to make conscious propositions about these schemas and themselves. This, in turn, strengthens their self-schemas as leaders and followers. In the next sections, I discuss the limitations and future directions of this research.

Limitations

Despite its contributions, this study is not without its limitations. First, this research only tested the first part of the Galatea process (i.e., self-expectation → motivation) without examining its impact on performance. However, as self-expectation is the key to Galatea effects, this research successfully demonstrated self-expectation as leaders and followers can be enhanced via AC. Second, although results showed that AC could be used to trigger Galatea effects, this research only included samples of undergraduate students. As such, further examination is needed to examine its ecological validity, particularly in organizational context. Researchers can attempt to replicate results from this research with worker samples. Third, while this research did not enhance individuals' self-expectation through deceptive verbal feedback, individuals were not

aware of the true purpose of this study. It is necessary to first show the effectiveness of enhancing individuals' self-expectations via AC without them knowing the true purpose of the study to avoid social desirability that may lead to positive results. Future studies may consider replicating the results of this study with complete transparency (i.e., let participants know the true purpose of the study prior to the experiment). Fourth, although results from this research were generally positive, it was a one-time lab experiment. Because AC is not resistant to extinction (Hofmann et al., 2010), the duration of such positive effect remains unknown. A longitudinal field experiment (e.g., McNatt & Judge, 2004) showed that the positive effect of Galatea interventions slowly diminished over time. Given the evidence from both the AC and self-fulfilling prophecy literature, the positive effect generated from both interventions may diminish over time. Future research should examine the duration of Galatea effects generated from AC and the specific "dosage" needed to reinforce their positive self-schemas as leaders and followers. Given that the current research uses a self-directed intervention, individuals can easily improve their self-schemas without employing deceptions.

Future Directions

Given the results, it appears AC is a suitable method to trigger Galatea effects in both leadership and followership domains. While performance should also increase due to the enhancement of self-expectation based on previous findings (e.g., Eden & Zuk, 1995; Leung & Sy, 2018), additional research is required to show that the activation of PILTs and PIFTs can result in higher performance. Specifically, researchers need to include a performance measure to assess whether those who have PILTs or PIFTs

activated would outperform those who do not have those schemas activated. For example, researchers may examine whether Galatea leaders receive higher leadership ratings from their subordinates and peers than those who do not have PILTs activated via AC. In the followership domain, researchers may investigate whether activating their PIFTs can lead to their performance ratings by subjective and objective performance ratings. Those who have become Galatea followers should receive higher ratings from their supervisors and peers and may outperform their peers in specific tasks (e.g., the number of sales).

In addition, future research should also explore other outcomes besides performance. Research has shown different outcomes of SN-MTL (Badura et al., 2019). Specifically, SN-MTL is positively related to leadership emergence, transformational leadership, transactional leadership, leader effectiveness, and negatively related to laissez-faire leadership. Similarly, future research can also examine follower-specific outcomes in the Galatea process. As individuals internalize PIFTs (i.e., industry, good citizen, and enthusiasm), their behaviors may behave consistent with those schemas. Such a claim is supported by the perception-behavior link (Bargh, Chen, & Burrows, 1996; Chen & Bargh, 1997). When PIFTs are activated via AC, they trigger associated conceptual representations. For example, activating the general concept of "me as a good follower" may activate the associated notion of a good citizen. Accordingly, the activation of these conceptual representations then enhances the tendency to behave in ways consistent with those beliefs. Individuals who are conditioned to associate themselves with more PIFTs may think and behave more positively than those who do not associate themselves with PIFTs. As such, it is a fruitful avenue for researchers to

examine how Galatea leadership and followership can impact different leadership and followership outcomes beyond performance.

Methodologically speaking, future research should examine how to increase the effect of AC in both leadership and followership domains more effectively. As AC is explained by the propositional account, there are ways to make the proposition-making process more effective than the current research proposed. Instead of flashing images of individuals (CS) and PILTs/PIFTs (US), researchers can implement a different form of tasks to get individuals to associate themselves with PILTs/PIFTs. One possible method is through a format similar to a sentence unscramble game/task, rather than the current method (i.e., memory game). In a typical sentence unscramble task, the goal is to unscramble the words to put them in the right order. Similar to the current method, individuals may upload their photos as the CS and use PILTs/PIFTs as the US. In addition, linking verbs (e.g., "is," "am," "can be," "have been") can be added to allow individuals to make sentences. For example, individuals may see (1) "is", (2) an image of themselves (CS), and (3) "dynamic" (US) in one trial, and their task is to create a sentence with the linking verb and stimuli. As such, "Alex (i.e., an image of themselves) is dynamic" is the correct response for this trial. Also, researchers can also make these sentences domain specific by adding the term "leader" or "follower" as part of the trials (e.g., "Alex-is-a-dynamic-leader" or "Alex-is-a-hardworking-follower"). By using a sentence unscramble task, individuals may be able to make conscious propositions of the CS-US pair more effectively. In addition, because AC tends to yield a bigger effect when

the CS-US pair occur concurrently rather than subsequently, researchers may find a much bigger effect.

Beyond Galatea effects, future research can also examine the plausibility of conducting self-directed Pygmalion leadership interventions via AC. Instead of using photos of themselves as CS, leaders may use photos of their followers as the CS and pair them with PIFTs. Because followers are paired continuously with PIFTs, their leaders are likely to see them more positively, triggering Pygmalion effects. Indeed, research has demonstrated that PIFTs can trigger Pygmalion effects. Specifically, leaders' PIFTs positively influence their performance expectations for their followers, impacting their liking and relationship quality with their followers, and in turn, positively influence follower performance (Whiteley et al., 2012). Similar to the way leaders' PIFTs can be enhanced via AC, it might be worthwhile to explore the plausibility of the "role reversed Pygmalion effects." That is, enhancing followers' expectations of their leaders to impact leader performance. When followers have higher expectations of their leaders, they may develop greater liking and relationship quality. On the basis of Leader-Member Exchange Theory (LMX), relationship quality is positively related to consequences such as leader career success, influence, and performance (Henderson, Liden, Glibkowski, & Chaudhry, 2009). As such, it may be worthwhile to take a follower-centric approach to examine the leadership process through the lens of followers.

Future research can examine the plausibility of Galatea leadership and followership interventions by associating individuals (CS) with a specific leader or follower (US), rather than words or attributes. Accordingly, individuals may internalize

the attributes of a specific leader or follower that then trigger Galatea effects. For example, researchers can constantly pair individuals' images with images of Barack Obama. Over time, individuals are likely to see themselves more like Barack Obama. If individuals think Barack Obama is dynamic, strong, and intelligent, they are likely to internalize those positive attributes, triggering Galatea effects. However, researchers must first assess individuals' attitudes toward a specific leader. If they see Barack Obama or any other CS negatively, results may backfire, producing Golem effects. Golem effects are the opposite of Galatea effects, in which negative expectation leads to negative outcomes. Until recently, Golem effects have been difficult to examine primarily due to ethical concerns that, by inducing negative expectations, corresponding outcomes may be harmful to individuals (Oz & Eden, 1994). For example, if individuals are associated with negative attributes, they are likely to internalize those negative attributes (e.g., manipulative, incompetent, insubordinate) and behave accordingly. Therefore, researchers must proceed with caution when exploring the feasibility of using this method.

Another area to explore is diversity and inclusion in the workplace. The term *diversity* reflects the similarities and differences of personal characteristics such as age, gender, ethnic heritage, physical abilities and disabilities, race and sexual orientation among employees in organizations (Griffin & Moorhead, 2006), while *inclusion* reflects the degree to which organizations and their members connect and engage people with differences (Ferdman, 2013). The benefits of diversity and inclusion may include increased employee retention and commitments with different backgrounds, effective

leadership, creativity, and innovation (O'Donovan, 2018). To this end, organizations may implement diversity training to raise awareness and develop skills to meet employees' and organizations' needs. Through training, employees may be more inclusive to people of different backgrounds, resulting in positive outcomes. However, like any training programs or interventions, organizations may face challenges as they deliver diversity and inclusion strategies, such as costs and resources. Future research can address issues in diversity and inclusion via AC. At the team level, individuals can include images of themselves (CS) and their teammates (US). As they start to associate with their teammates via AC, they are likely to develop a shared social identity (i.e., "we" instead of "you" and "I"). The main tenet of social identity is that team members view others fit with the overall team prototype (van Knippenberg & Hogg, 2003). The team prototype is likely to influence how individuals define themselves within the team as they self-categorize themselves based on prototypical team characteristics. The more fully individuals internalize their team prototypes and define themselves similarly to other team members, they are likely to perceive, feel, and behave correspondingly to the team prototype (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). Individuals who resemble prototypical attributes of the group are considered in-group, while those who do not resemble the team's prototypical attributes are perceived as out-group members. As such, researchers can develop a self-directed diversity and inclusion intervention via AC to foster a shared social identity, triggering both Galatea and Pygmalion effects.

Lastly, organizations can use AC as a tool to foster organizational culture. Organizational culture is crucial to organizations' effectiveness (Gregory, Harris,

Armenakis, & Shook, 2009), as it contains a set of beliefs, values, and assumptions shared by members of an organization (Schein, 1985). When employees share similar values with their organizations, they are likely to have a higher organizational commitment, job satisfaction, and lower turnover rate (O'Reilly, Chatman, & Caldwell, 1991). As such, organizations can use AC to get their employees to associate themselves with organizations' core values. For example, employees can pair photos of themselves (CS) with specific core values (e.g., customers come first) (US). With enough pairings over time, employees may internalize these organizations' core values (e.g., customers come first), and behave accordingly (e.g., deliver great customer service) (Bargh et al., 1996; Chan & Bargh, 1997). Alternatively, employees can pair photos of themselves (CS) with their organizations' logos (US). Because logos may reflect idealized and aspirational attributes, employees who associate themselves with their organizations' logos are likely to internalize those attributes, triggering Galatea effects.

Closing Statement

Galatea effects have been shown to be crucially important for individuals who wish to enhance their performance. Combined with technology, Galatea interventions can be self-directed and without any deceptions. There is much more to be learned about Galatea effects, and the role that ACs plays to trigger them. Ultimately, insights from this research offer many research and practical ideas for creating a productive work environment.

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Footnote

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[2]Moderation analyses were conducted in both studies to examine whether gender, age, and education level affect the results (see supplementary tables). However, because the study samples included only students, mostly first and second years, the variability is minimal in age and education level. Future studies should examine whether age and education level moderate the relationship between PILTs/PIFTs and LSE/MTL/GSE/PM with worker samples.

Table 1.

Means and Standard Deviations of PILTs, LSE, and MTL by conditions (Study 1)

Condition	n	$Time_1$ PILTs	$Time_2$ PILTs	$Time_1$ LSE	$Time_2$ LSE	$Time_1$ SNMTL	$Time_2$ SNMTL	$Time_1$ AFFMTL	Time2 AFFMTL	$Time_1$ NCMTL	Time2 NCMTL
Experiment	80	7.39	7.65	4.82	4.97	5.26	5.42	4.32	4.35	3.25	3.15
		(.96)	(1.02)	(1.25)	(1.30)	(1.27)	(1.25)	(1.42)	(1.43)	(1.07)	(1.31)
Control	80	7.34	7.27	4.89	4.86	5.31	5.13	4.43	4.48	3.40	3.31
		(.72)	(.80)	(1.06)	(1.00)	(.96)	(1.01)	(1.28)	(1.24)	(1.14)	(1.31)

Table 2.
Correlations Among Variables (Study 1)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Condition	1													
2. Age	--	1												
3. Gender	--	.32***	1											
4. Education	--	.56***	.18*	1										
5. $Time_1$ PILTs	.03	.09	.02	.01	1									
6. $Time_2$ PILTs	.21**	.12	.07	.03	.78***	1								
7. $Time_1$ LSE	-.03	.13	.10	.06	.51***	.80***	1							
8. $Time_2$ LSE	.05	.12	.12	.12	.51***	.48***	.84***	1						
9. $Time_1$ AFFMTL	-.04	.07	.06	.01	.34***	.33***	.69***	.64***	1					
10. $Time_2$ AFFMTL	-.05	.11	.04	.08	.29***	.31***	.62***	.66***	.86***	1				
11. $Time_1$ SNMTL	-.03	.00	.02	.03	.27***	.28***	.46***	.46***	.57***	.51***	1			
12. $Time_2$ SNMTL	.12	-.06	-.03	.04	.31***	.31***	.49***	.49***	.53***	.53***	.77***	1		
13. $Time_1$ NCMTL	-.05	.25**	.30**	.11	-.07	-.09	-.02	.01	-.05	.03	-.15	-.17*	1	
14. $Time_2$ NCMTL	-.06	.21**	.33**	.17*	-.15	-.19*	.01	.01	-.01	.03	-.10	-.15	.71***	1

Note. *** = $p < .001$. ** = $p < .01$. * = $p < .05$.

Table 3.

Results of Multiple Regression Models (Study 1)

Model: Predictor & Dependent Variables	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Model 1: Condition & Time$_2$ PILTs	.64					
Time$_1$ PILTs		.86 (.05)	[.75, .96]	0.78	16.43	<.001
Condition		.34 (.09)	[.16, .51]	0.18	3.82	<.001
Model 2: Condition & Time$_2$ LSE	.72					
Time$_1$ LSE		.85 (.04)	[.77, .94]	.85	20.13	<.001
Condition		.18 (.10)	[-.01, .37]	.08	1.84	.068
Model 3: Condition & Time$_2$ SN-MTL	.60					
Time$_1$ SN-MTL		.78 (.05)	[.68, .88]	.77	15.40	<.001
Condition		.33 (.11)	[.10, .56]	.15	2.91	.004
Model 4: Condition & Time$_2$ AFF-MTL	.75					
Time$_1$ AFF-MTL		.86 (.04)	[.78, .94]	.86	21.61	<.001
Condition		-.03 (.11)	[-.23, .19]	-.01	-.31	.754
Model 5: Condition & Time$_2$ NC-MTL	.49					
Time$_1$ NC-MTL		.83 (.07)	[.69, .96]	.70	12.27	<.001
Condition		-.04 (.15)	[-.33, .26]	-.01	-.25	.803

Table 4.
Results of Mediation Analyses (Study 1)

	Product of coefficients				Bootstrapping bias-corrected 95% *CI*	
Model	Estimate	*SE*	*Z*	*p*	Lower limit	Upper limit
$Time_2$ PILTs → $Time_2$ LSE → $Time_2$ SNMTL (All)						
Total	.38	.09	4.24	.00	.21	.56
Direct	.13	.10	1.24	.22	-.06	.32
Indirect	.26	.06	4.24	.00	.16	.40
$Time_2$ PILTs → $Time_2$ LSE → $Time_2$ SNMTL (Exp)						
Total	.43	.13	3.42	.00	.20	.69
Direct	.16	.14	1.18	.24	-.09	.45
Indirect	.27	.09	2.95	.00	.12	.48
$Time_2$ PILTs → $Time_2$ LSE → $Time_2$ SNMTL (Con)						
Total	.26	.16	1.64	.10	-.07	.56
Direct	.00	.16	.01	.99	-.32	.31
Indirect	.26	.09	3.09	.00	.12	.46
$Time_1$ PILTs → $Time_1$ LSE → $Time_1$ SNMTL (All)						
Total	.36	.10	3.69	.00	.18	.57
Direct	.07	.09	.73	.47	-.12	.25
Indirect	.30	.08	3.76	.00	.17	.48
$Time_1$ PILTs → $Time_1$ LSE → $Time_1$ SNMTL (Exp)						
Total	.37	.14	2.70	.01	.15	.69
Direct	.01	.14	.09	.93	-.25	.29
Indirect	.36	.12	2.94	.00	.16	.65
$Time_1$ PILTs → $Time_1$ LSE → $Time_1$ SNMTL (Con)						
Total	.35	.15	2.32	.02	.06	.65
Direct	.13	.14	.94	.35	-.15	.40
Indirect	.22	.10	2.36	.02	.07	.44

Note. Bootstrap sample size = 10,000. *CI* = confidence intervals.

Table 5.

Means and Standard Deviations of PIFTs, GSE, and PM by conditions (Study 2)

Variable	Sample Size	$Time_1$ PIFTs	$Time_2$ PIFTs	$Time_1$ GSE	$Time_2$ GSE	$Time_1$ PM	$Time_2$ PM
Experimental	80	7.32	7.76	3.83	3.90	5.52	5.68
		(1.26)	(1.15)	(.63)	(.68)	(1.09)	(.98)
Control	80	7.31	7.30	3.79	3.66	5.47	5.45
		(1.15)	(1.05)	(.57)	(.66)	(1.02)	(1.12)

Table 6.

Correlations among variables (Study 2)

Variables	Condition	Age	Gender	Education	$Time_1$ PIFTs	$Time_2$ PIFTs	$Time_1$ GSE	$Time_2$ GSE	$Time_1$ PM	$Time_2$ PM
Condition	1									
Age	--	1								
Gender	--	.17*	1							
Education	--	.75**	.16*	1						
$Time_1$ PIFTs	.01	-.06	.16*	-.06	1					
$Time_2$ PIFTs	.21*	-.07	-.18*	-.06	.83**	1				
$Time_1$ GSE	.03	.14	-.02	-.07	.40**	.48**	1			
$Time_2$ GSE	.18*	.07	-.01	-.03	.35**	.51**	.87**	1		
$Time_1$ PM	.02	.01	-.11	-.03	.34**	.39**	.57**	.64**	1	
$Time_2$ PM	.11	.01	.01	-.004	.35**	.42**	.61**	.72**	.84**	1

Note. $^{**}p < .001$ $^{*}p < .05$

Table 7.

Results of Multiple Regression Models (Study 2)

Model: Predictor & Dependent Variables	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Model 1: Condition & Time$_2$ PIFTs	.72					
Time$_1$ PIFTs		.77 (.04)	[.70, .84]	.82	19.60	<.001
Condition		.45 (.09)	[.27, .64]	.20	4.83	<.001
Model 2: Condition & Time$_2$ GSE	.78					
Time$_1$ GSE		.98 (.04)	[.89, 1.06]	.87	23.14	<.001
Condition		.20 (.05)	[.10, .30]	.15	3.92	<.001
Model 3: Condition & Time$_2$ PM	.71					
Time$_1$ PM		.84 (.04)	[.76, .93]	.84	19.81	<.001
Condition		.19 (.10)	[.02, .37]	.09	2.18	.030

Table 8.
Results of Mediation Analyses (Study 2)

	Product of coefficients				Bootstrapping bias-corrected 95% *CI*	
Model	Estimate	*SE*	*Z*	*p*	Lower limit	Upper limit
$Time_2$ PIFTs → $Time_2$ GSE → $Time_2$ PM (All)						
Total	.40	.07	5.36	.00	.25	.54
Direct	.07	.07	1.02	.31	-.06	.20
Indirect	.33	.06	5.93	.00	.22	.45
$Time_2$ PIFTs → $Time_2$ GSE → $Time_2$ PM (Exp)						
Total	.41	.11	3.66	.00	.19	.62
Direct	.10	.09	1.12	.26	-.06	.28
Indirect	.31	.07	4.20	.00	.18	.46
$Time_2$ PIFTs → $Time_2$ GSE → $Time_2$ PM (Con)						
Total	.37	.11	3.49	.00	.16	.58
Direct	.05	.11	.45	.65	-.15	.28
Indirect	.33	.10	3.32	.00	.16	.54
$Time_1$ PIFTs → $Time_1$ GSE → $Time_1$ PM (All)						
Total	.30	.08	3.80	.00	.15	.46
Direct	.12	.07	1.66	.10	-.02	.26
Indirect	.18	.05	3.87	.00	.10	.28
$Time_1$ PIFTs → $Time_1$ GSE → $Time_1$ PM (Exp)						
Total	.37	.12	3.05	.00	.15	.63
Direct	.14	.12	1.20	.23	-.06	.41
Indirect	.23	.06	3.79	.00	.12	.36
$Time_1$ PIFTs → $Time_1$ GSE → $Time_1$ PM (Con)						
Total	.21	.09	2.22	.03	.01	.37
Direct	.10	.09	1.07	.28	-.09	.26
Indirect	.11	.07	1.55	.12	.00	.28

Note. Bootstrap sample size = 10,000. *CI* = confidence intervals. The lower *CI* limit of the indirect effect for $Time_1$ Control is .002.

Supplementary Table 1.

Results of Moderation Models for Gender (Study 1)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PILTs	.64					
Time$_1$ PILTs		.85 (.05)	[.75, .96]	.78	16.25	<.001
Condition		.32 (.10)	[.12, .52]	.17	3.20	.002
Gender		.04 (.17)	[-.29, .38]	.02	.25	.802
Condition x Gender		.03 (.22)	[-.41, .46]	.01	.12	.903
Moderation 2: Condition & LSE	.72					
Time$_1$ LSE		.85 (.04)	[.07, .50]	.85	20.24	<.001
Condition		.28 (.11)	[.03, .77]	.12	2.57	.011
Gender		.40 (.18)	[.03, .77]	.14	2.17	.032
Condition x Gender		-.53 (.24)	[-1.00, -.06]	-.16	-2.24	.027
Moderation 3: Condition & SN-MTL	.60					
Time$_1$ SN-MTL		.79 (.05)	[.68,.89]	.77	15.40	<.001
Condition		.35 (.13)	[.09, .61]	.15	2.71	.007
Gender		-.17 (.22)	[-.61, .25]	-.07	-.81	.417
Condition x Gender		.002 (.28)	[-.56, .56]	.001	.001	.995

Supplementary Table 2.

Results of Moderation Models for Age (Study 1)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PILTs	.64					
Time$_1$ PILTs		.85 (.05)	[.74, .95]	.77	16.01	<.001
Condition		-.35 (.76)	[-1.86, 1.15]	-.19	-.64	.644
Age		-.00 (.03)	[-.06, .06]	-.002	-.03	.976
Condition x Age		.04 (.04)	[-.04, .11]	.38	.92	.361
Moderation 2: Condition & LSE	.72					
Time$_1$ LSE		.86 (.04)	[.78, .95]	.86	20.08	<.001
Condition		1.64 (.84)	[-.02, 3.30]	.71	1.95	.053
Age		.05 (.35)	[-.02, .12]	.10	1.50	.137
Condition x Age		-.08 (.45)	[-.16, .01]	-.64	-1.75	.08
Moderation 3: Condition & SN-MTL	.61					
Time$_1$ SN-MTL		.77 (.05)	[.78, .94]	.76	15.16	<.001
Condition		-1.59 (.98)	[-.02, 3.30]	-.70	-1.62	.107
Age		-.09 (.04)	[-.02, .12]	-.18	-2.25	.026
Condition x Age		.10 (.05)	[-.16, .01]	.85	1.97	.051

Supplementary Table 3.

Results of Moderation Models for Education level (Study 1)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PILTs	.64					
Time$_1$ PILTs		.85 (.05)	[.75, .95]	.77	16.20	<.001
Condition		.15 (.18)	[-.20, .52]	.08	.87	.388
Education		-.02 (.06)	[-.15, .10]	-.02	-.36	.717
Condition x Education		.10 (.10)	[-.07, .28]	.12	.92	.253
Moderation 2: Condition & LSE	.72					
Time$_1$ LSE		.85 (.04)	[.77, .93]	.85	19.84	<.001
Condition		.25 (.20)	[-.15, .65]	.11	1.23	.222
Education		.10 (.07)	[-.03, .24]	.09	1.47	.143
Condition x Education		-.03 (.10)	[-.23, .16]	-.03	-.33	.739
Moderation 3: Condition & SN-MTL	.62					
Time$_1$ SN-MTL		.77 (.05)	[.67, .87]	.76	15.19	<.001
Condition		-.17 (.23)	[-.63, .30]	-.07	-.71	.478
Education		-.12 (.08)	[.05, .51]	-.10	-1.46	.146
Condition x Education		.28 (.12)	[.05, .51]	.27	2.45	.016

Supplementary Table 4.

Results of Moderation Models for Gender (Study 2)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PIFTs	.64					
Time$_1$ PIFTs		.76 (.04)	[.68, .84]	.82	16.25	<.001
Condition		.41 (.12)	[.17, .64]	.18	3.20	<.001
Gender		-.12 (.15)	[-.41, .17]	-.05	.25	.429
Condition x Gender		.14 (.20)	[-.25, .53]	.05	.12	.490
Moderation 2: Condition & GSE	.77					
Time$_1$ GSE		.98 (.04)	[.90, .1.06]	.85	22.99	<.001
Condition		.21 (.06)	[.08, .34]	.12	3.28	.001
Gender		-.004 (.18)	[-.16, .15]	.14	-.06	.952
Condition x Gender		-.03 (.11)	[-1.24, .18]	-.16	-.27	.785
Moderation 3: Condition & PM	.71					
Time$_1$ PM		.85 (.04)	[.76,.93]	.85	19.79	<.001
Condition		.13 (.11)	[-.10, .35]	.06	1.11	.271
Gender		.03 (.14)	[-.24, .30]	.01	.19	.851
Condition x Gender		.15 (.19)	[-.22, .52]	.06	.81	.419

Supplementary Table 5.

Results of Moderation Models for Age (Study 2)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PIFTs	.72					
Time$_1$ PIFTs		.77 (.03)	[.69, .84]	.82	19.44	<.001
Condition		.87 (1.30)	[-1.70, 3.45]	.39	.67	.504
Age		.01 (.05)	[-.05, .06]	.02	.26	.794
Condition x Age		-.02 (.07)	[-.12, .03]	-.19	-.32	.747
Moderation 2: Condition & GSE	.78					
Time$_1$ GSE		.98 (.04)	[.90, 1.07]	.87	22.92	<.001
Condition		1.09 (.84)	[-.30, 2.47]	.80	1.54	.124
Age		.01 (.35)	[-.05, .06]	.01	.22	.830
Condition x Age		-.08 (.45)	[-.12, .03]	-.66	-1.28	.204
Moderation 3: Condition & PM	.71					
Time$_1$ PM		.84 (.04)	[.78, .94]	.76	19.55	<.001
Condition		.07 (1.24)	[-.02, 3.30]	-.70	.05	.957
Age		.001 (.05)	[-.02, .12]	-.18	.03	.979
Condition x Age		.01 (.05)	[-.16, .01]	.85	.10	.918

Supplementary Table 6.

Results of Moderation Models for Education level (Study 2)

Moderation: Predictor & Dependent Variable	Adjusted R^2	*b*(SE)	95% CI	β	*t*	*p*
Moderation 1: Condition & Time$_2$ PIFTs	.72					
Time$_1$ PIFTs		.77 (.04)	[.69, .84]	.82	19.42	<.001
Condition		.47 (.20)	[.07, .87]	.21	2.35	.020
Education		.003 (.07)	[-.13, .13]	.003	.05	.959
Condition x Education		-.01 (.09)	[-.20, .18]	-.01	-.10	.922
Moderation 2: Condition & GSE	.78					
Time$_1$ GSE		.98 (.04)	[.90, .1.07]	.87	23.22	<.001
Condition		.36 (.11)	[.15, .57]	.27	3.36	<.001
Education		.03 (.04)	[-.04, .10]	.04	.82	.415
Condition x Education		-.09 (.05)	[-.19, .01]	-.15	-.33	.088
Moderation 3: Condition & PM	.71					
Time$_1$ PM		.84 (.04)	[.76, .93]	.84	19.72	<.001
Condition		.15 (.19)	[-.23, .52]	.07	.78	.437
Education		-.04 (.06)	[-.16, .08]	-.04	-.61	.540
Condition x Education		.02 (.09)	[-.15, .20]	.03	.26	.794

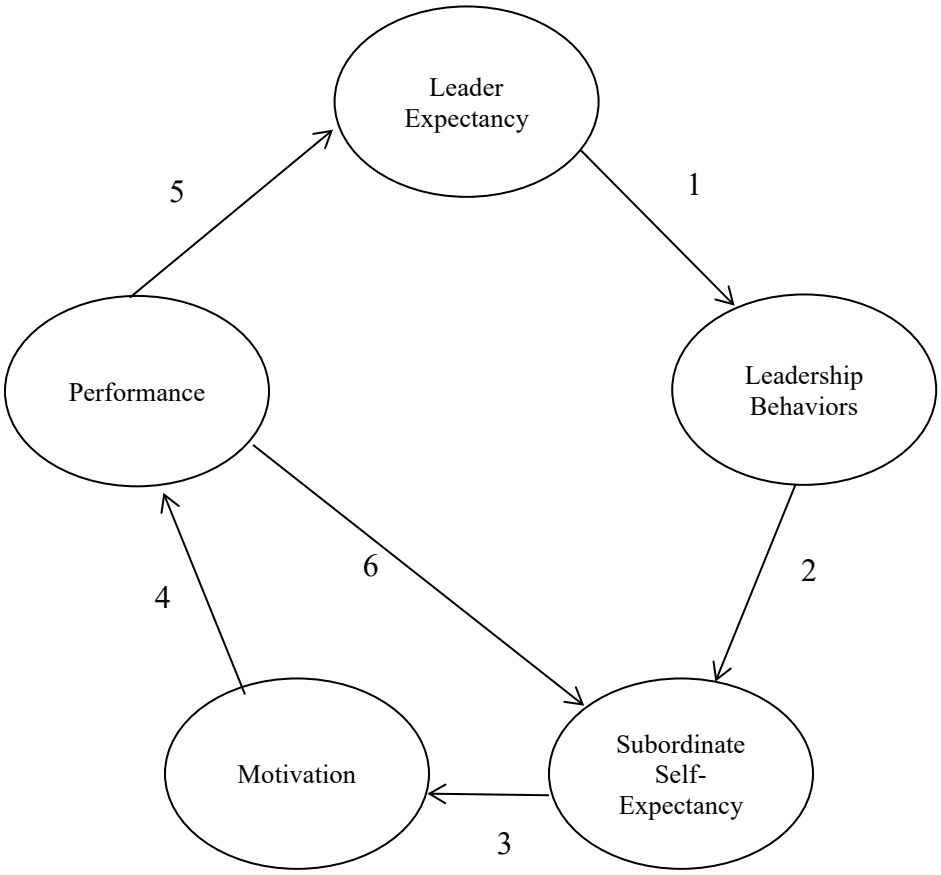

Figure 1. A model of the self-fulfilling prophecy at work

Game Setup

Gameplay/ Progression of Trial

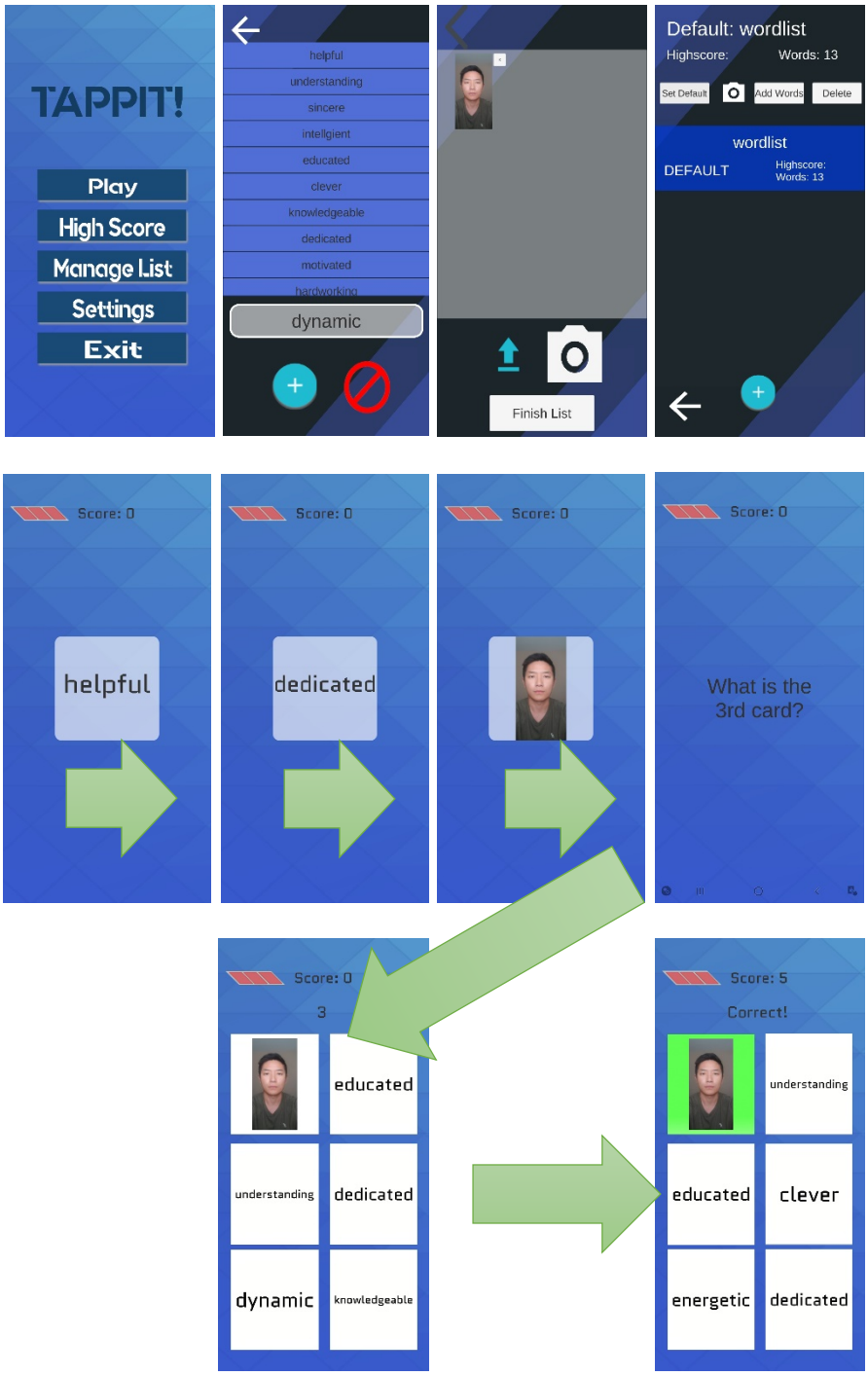

Figure 2. Screenshots of TAPPIT setup and gameplay. TAPPIT begins with a menu consisting of "Play," "High Score," "Manage list," "Settings," and "Exit." The "Manage list" button allows for users to customize photos and words. When users select "Play," TAPPIT shows a sequence of random words and photos, and then prompts users with a quiz of the card sequence (e.g., "What is the 3rd card?"). From a bank of cards, users are then asked to identify the correct card within a short timeframe (e.g., 3 seconds). Users move on to the next trial after their selection.

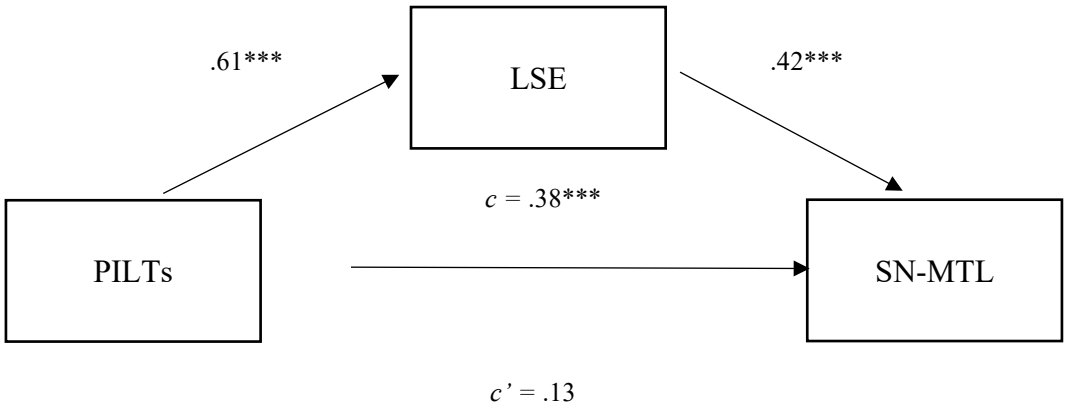

Figure 3. Time$_2$ model with all participants. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

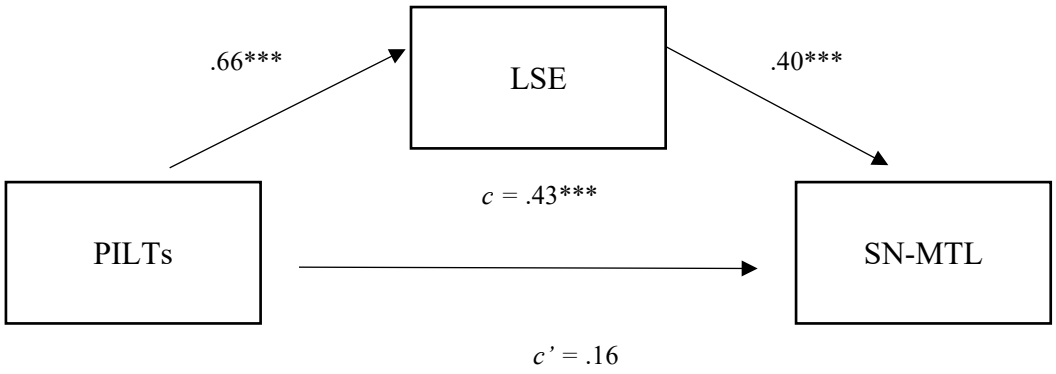

Figure 4. Time$_2$ model with participants in experimental condition. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

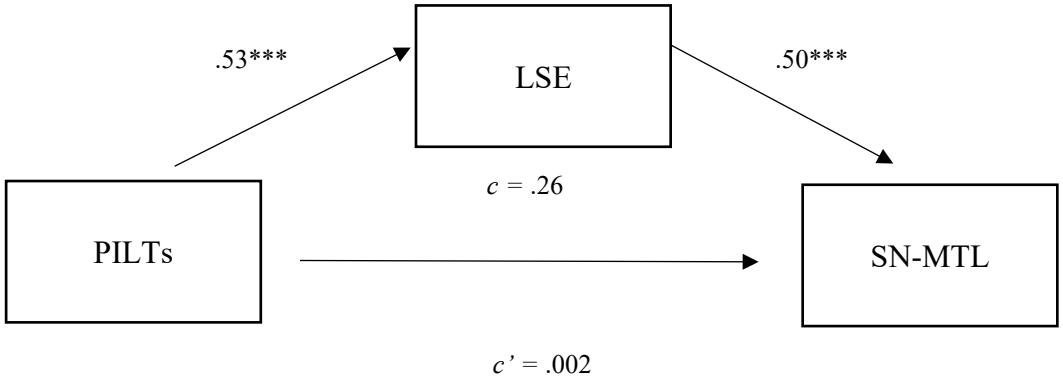

Figure 5. Time$_2$ model with participants in control condition. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

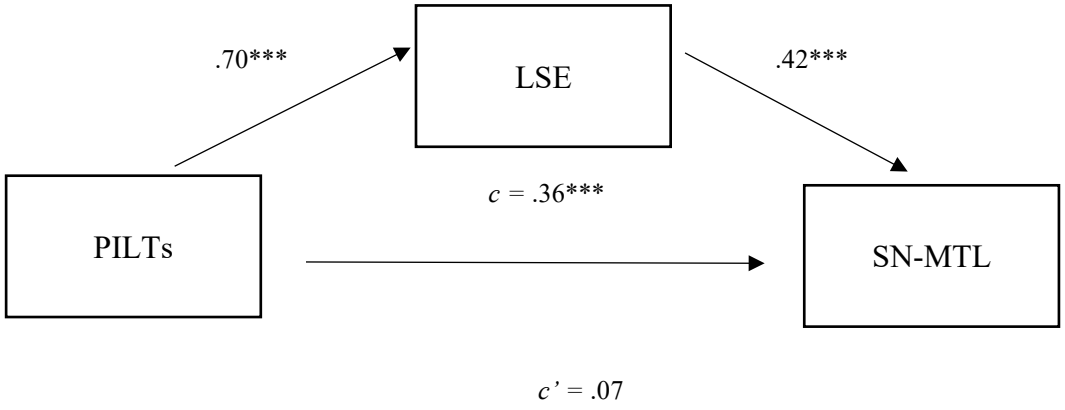

Figure 6. Time_1 model with all participants. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

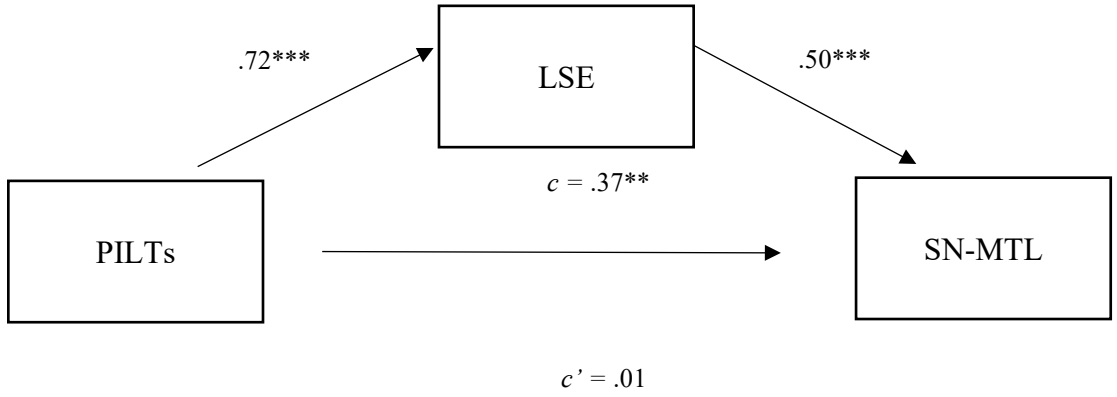

Figure 7. Time$_1$ model with participants in experimental condition. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. $^{**}p < .01$ $^{***}p < .001$

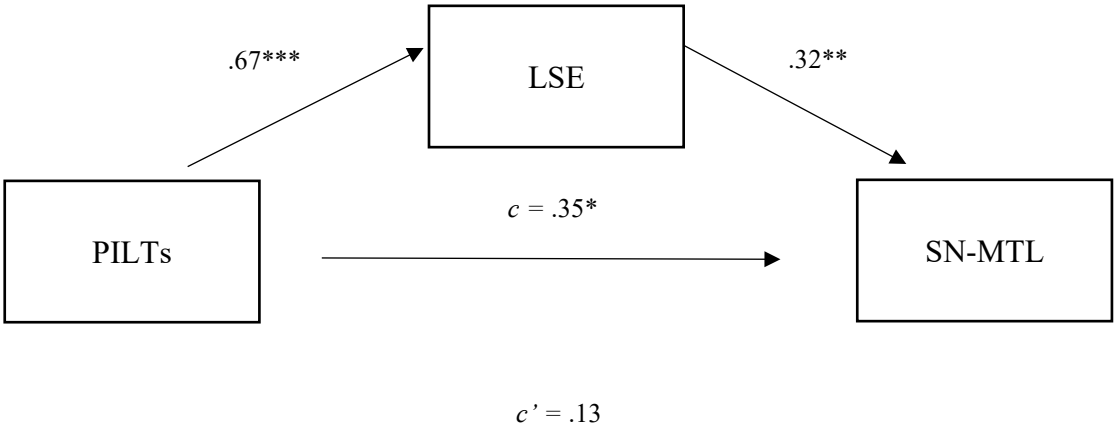

Figure 8. Time$_1$ model with participants in control condition. LSE as mediator of PILTs and SN-MTL. The numbers represent standardized coefficients derived from a bootstrap procedure. *$p < .05$ **$p < .01$ ***$p < .001$

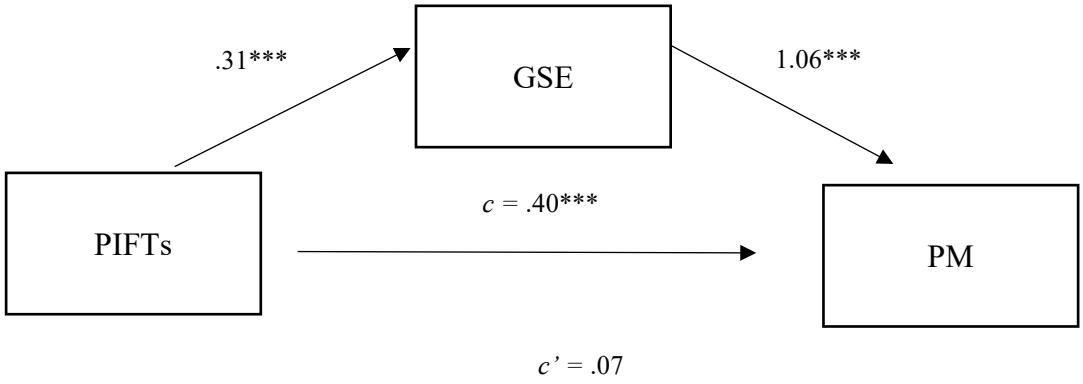

Figure 9. Time$_2$ model with all participants. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

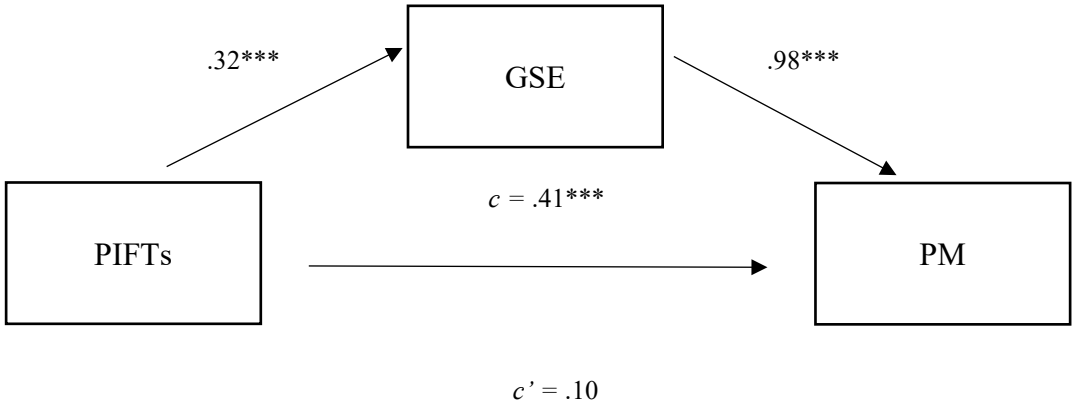

Figure 10. Time$_2$ model with participants in experimental condition. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

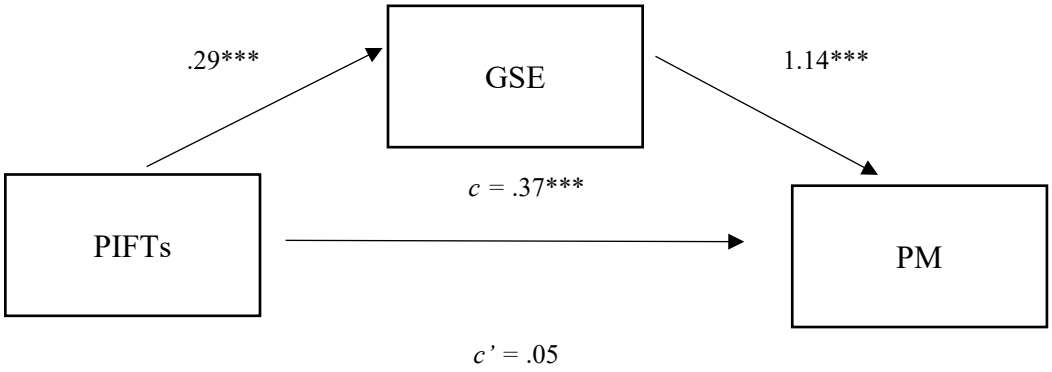

Figure 11. Time$_2$ model with participants in control condition. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

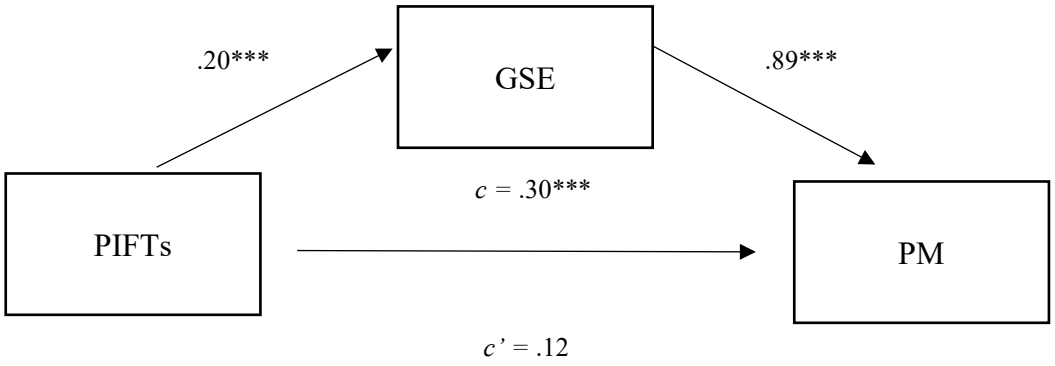

Figure 12. Time$_1$ model with all participants. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. ***$p < .001$

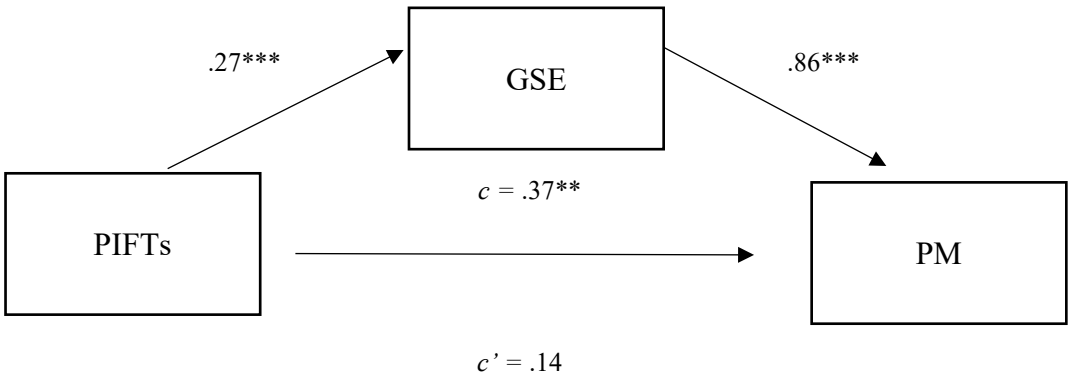

Figure 13. Time$_1$ model with participants in experimental condition. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. $^{**}p < .01^{***}p < .001$

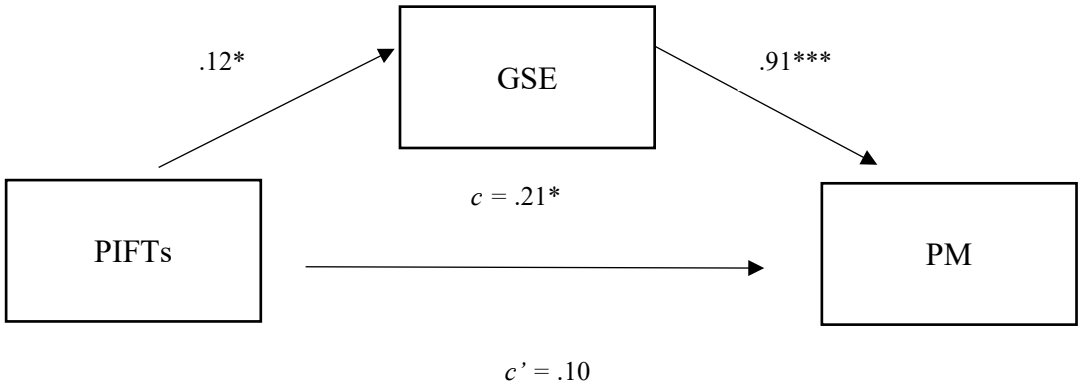

Figure 14. Time$_1$ model with participants in control condition. Self-Efficacy as mediator of PIFTs and Personal Mastery. The numbers represent standardized coefficients derived from a bootstrap procedure. *$p < .10$ ***$p < .001$

Appendix A

	Positive Implicit Leadership Theories (Study 1); Epitropaki & Martin (2004)
1.	Helpful
2.	Understanding
3.	Sincere
4.	Intelligent
5.	Educated
6.	Clever
7.	Knowledgeable
8.	Dedicated
9.	Motivated
10.	Hardworking
11.	Energetic
12.	Strong
13.	Dynamic
	Leadership Self-Efficacy (Study 1); Chan & Drasgow (2001)
1.	I feel confident that I can be an effective leader in most of the groups that I work with
2.	I am not confident that I can lead others effectively
3.	I have the ability to lead others to achieve any goal I set for them
4.	I can use my leadership skills to deal effectively with any situation
5.	Through my leadership, I can make any situation come out the way I intend it to

Appendix A (continued)

	Social-Normative Motivation to Lead (Study 1); Chan & Drasgow (2001)
1.	I feel I have a duty to lead others if I am asked
2.	I agree to lead whenever I am asked or nominated by the other members
3.	I was taught to believe in the value of leading others
	Affective-Identity Motivation to Lead (Study 1); Chan & Drasgow (2001)
1.	Most of the time, I prefer being a leader rather than a follower when working in a group
2.	I usually want to be the leader in the groups that I work in
3.	I never expect to get more privileges if I agree to lead a group
	Non-Calculative Motivation to Lead (Study 1); Chan & Drasgow (2001)
1.	I am only interested to lead a group if there are clear advantages for me
2.	I would want to know what's in for me if I am going to agree to lead a group
3.	I never expect to get more privileges if I agree to lead a group

Appendix B

	Positive Implicit Followership Theories (Study 2); Sy (2010)
1.	Hardworking
2.	Goes-above-and-beyond
3.	Productive
4.	Loyal
5.	Reliable
6.	Team player
7.	Excited
8.	Outgoing
9.	Happy
	General Self-Efficacy (Study 2); Chen, Gully, & Eden (2001)
1.	I will be able to achieve most of the goals that I have set for myself
2.	When facing difficult tasks, I am certain that I will accomplish them
3.	In general, I think that I can obtain outcomes that are important to me
4.	I believe I can succeed at most any endeavor to which I set my mind
5.	I will be able to successfully overcome many challenges
6.	I am confident that I can perform effectively on many different tasks
7.	Compared to other people, I can do most tasks very well
8.	Even when things are tough, I can perform quite well

Appendix B (continued)

	Personal Mastery (Study 2); Lachman & Weaver (1998)
1.	I can do just about anything I really set my mind to
2.	When I really want to do something, I usually find a way to succeed at it
3.	What happens to me in the future mostly depends on me
4.	Whether or not I am able to get what I want is in my own hands

Appendix C

Study Script

Participants in both conditions received the same set of instructions across both studies.

"Thank you for participating in our study. In this study, we are interested in your self-perceptions of leadership and your ability to recall photos and words. This study consists of two parts. First, you will be instructed to play a memory game. Your job is to recall photos and words in the correct order. In the second part of this study, you will be completing a short survey evaluating your own qualities as a leader. Before we begin, please read over the informed consent carefully and if there are no objections, proceed to the next page."

"As mentioned earlier, you will first play a memory recall game. Each one of you should have a smartphone in front of you. Does anyone NOT have a smartphone in front of you?"

"Looks like everyone has a smartphone. Now, please open the game application named TappIT2 and please do not click on anything else."

"Please click on "Settings" then "Manage list" [Repeat this step if necessary]"

"Now, please click on the camera icon and take a selfie (photo of yourself). Make sure the photo you take is clear and your face is centered on the image. [Assist participants if necessary]"

"Now that you have the game all set up, let me tell you what TAPPIT is about. TAPPIT is a memory game designed with an ever-increasing level of difficulty for your extended playability and entertainment. Your goal is to view and remember a series of words and images presented sequentially in a one second interval.

When the series of words and images has ended, you will be asked to choose one of the words/images you saw from a bank of potential answers. For example, you might see an image of yourself, the word "table", and the word "rocket." You will then be asked "What is the first card? Or what is the second card?" Your job is to recall the correct image or words.

Keep in mind that time is of the essence. Choosing accurately and quickly will ensure you earn the most points and bragging rights.

In the next 30 minutes, please try your best in recalling the sequence of words and images. If you go pass a level, please hit "continue." Each of you will have three lives. If you run out of lives, please hit "restart" or the "play" button in the main menu. I will be

monitoring and will let all of you know when to stop playing. Do you have any questions? You may now begin."

"Okay, time's up. Please put the phone away. Now, we will start the second part of the study. In this part of the study, you will be completing a survey evaluating yourself as a leader on the computer. Any questions? You may now begin and please stay seated when you are finished."