

Implicit Leadership: Exploring the Role of Leaders on the Implicit Activation of Self-Interest

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Lord and Brown (Lord, Brown, & Freiberg, 1999; Lord & Brown, 2004) suggest that leaders may impact followers by priming certain goals or ideals in their followers' minds, which in turn influence judgment and behaviour. The current research examined whether transformational and transactional leaders unconsciously affect the values followers adopt and the goals they pursue, specifically the impact leaders have on follower self-interest. Although the relationship between leadership and self-interest has attracted a good deal of theoretical attention, little empirical work has been conducted to explore the impact of leadership on self-interest. Using established priming techniques, I demonstrated in three studies that transformational and transactional leaders affect self-interest in characteristic ways. In Study 1, participants read about a transformational and transactional leader and were subsequently primed with the image of one of the leaders. The results showed that participants primed with the transformational leader exhibited lower self-interest than those primed with the transactional leader. Study 2 replicated this effect, and demonstrated that the image of the leaders had a nonconscious effect on participants' self-interest that was measurable after a delay of three days. Furthermore, this study found that participants' pre-existing levels of prosocial values moderated the effectiveness of the prime. Study 3 extended the results of the first two studies by demonstrating that priming participants with a transformational leader significantly lowered self-interest in a context where individual gain was salient, and the transactional leader increased self-interest in a context focused on collective outcomes.

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Dedication

For all your support, all your wisdom, all your patience, and all your love, I dedicate this dissertation to you, Jennifer. Like so much in my life, I couldn't have done it without you.

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Chapter 1

Implicit Leadership: Exploring the Role of Leaders on the Implicit Activation of Self-Interest

"The transformational leader can move those influenced to transcend their own self-interest for the good of the group, organization, or country."

- B. Bass (1985, p. 15)

"... the charismatic leader ... encourages followers to transcend their individual self-interests for the collective's [interests]".

- Conger & Kanungo (1998, p.17)

Leadership is a fundamental process, evident in both human and animal species (Bass, 2008), and is one of the most investigated phenomena in the social sciences (Day & Antonakis, 2011). Leadership is crucial for successful organizational functioning for a variety of reasons. Leaders create and highlight group goals and values, integrate divergent individual personalities in their group, facilitate the deployment of group member strengths, and resolve conflicts among group members (Bass, 2008). Successful leadership typically involves the pursuit and achievement of outcomes that are outside the capacity of a single individual through the use of influence processes to focus the attention of members of a group towards strategic objectives of the organization (Day & Antonakis, 2011).

Despite having been a focus for scholars for millennia, there is a surprising lack of agreement about what constitutes leadership; it has been suggested that there are as many theories of leadership as there are leadership theorists (Feidler, 1971). Although leadership has been described from a number of perspectives, including but not limited to leader traits, leader behaviours, patterns of interaction, role relationships, follower perceptions, influence on task goals, and influence on organizational culture, a common thread that binds most

conceptualizations of leadership is that it is, at its core, an influence process between leaders and followers that is explained by the leader's dispositional characteristics and behaviours, follower perceptions of the leader, and the context in which the influence occurs (Day & Antonakis, 2011).

The influence process of leadership has predominantly been studied from the perspective of the leader, focusing on the leader's traits and behaviours and easily observable follower outcomes, such as satisfaction and performance. As Lord and Brown (2004) discuss, this focus results in a restriction of the elements of the leadership process that have been studied, leaving the role of the follower as a participant in the leadership process largely ignored. In order to fully understand why and how leaders influence followers, it is necessary to study how particular followers react to the leader's traits and behaviours. Theoretically, the influence process is highly effective when there is congruence between the nature of leader influence and follower characteristics, whereas incongruence between leader and follower may result in an ineffective leadership process (Lord & Brown, 2004). Howell and Shamir (2005) suggest that follower characteristics powerfully impact their reactions to leaders, and followers can differ in terms of their sensitivity to a particular leader's influence depending on those characteristics. For example, while autocratic leadership, characterized by dominating, pushy, and disrespectful behaviour, is associated with higher levels of burnout, this is only true for followers high in neuroticism. Levels of burnout for followers low in neuroticism are largely unaffected by autocratic leadership behaviour. Compared to a follower with low neuroticism, the highly neurotic follower likely experiences more stress when working with an autocratic leader due to their affective instability and proneness to psychological distress, and so is much more sensitive to the negative aspects of this leadership style (De Hoogh & Den Hartog, 2009). Interestingly,

according to contextual personality theory (Fleeson, 2001), dispositional tendencies (i.e., traits) may be more aptly characterized as a baseline from which characteristics vary based on the particular situation in which an individual finds himself/herself. For example, the type of goal individuals pursue (e.g., approach goals vs. avoid goals) can have an impact on their personality. Approach goals focus on pursuing a positive outcome, whereas avoidance goals focus on avoiding a negative outcome (Elliot & Thrash, 2002). The same individuals will report higher levels of extraversion and lower levels of neuroticism while pursuing a greater number of approach goals relative to avoid goals, but report lower levels of extraversion and higher levels of neuroticism while pursuing a greater number of avoid goals (Heller, Komar, & Lee, 2007).

Similarly, leaders may be capable of producing a change in the dispositional characteristics of their followers. For example, Lord and Brown (Lord, Brown, & Freiberg, 1999; Lord & Brown, 2004) suggest that leaders have an impact on the behaviour of a follower, in part, by first making certain goals, ideals, and aspects of the self-concept more salient in the follower's mind, which in turn influence the subordinate's judgment and behaviour. In essence, leaders may be capable of directly affecting the characteristics of their followers such that the congruence between the leader's influence and those follower characteristics is enhanced, with the followers becoming more sensitive to the leader's message as a result. This follower-centric approach to leadership is important because it acknowledges the subjective nature of leadership influence, or more specifically, the intimate relationship between leader influence and follower characteristics and cognitive processes. Without recognizing the importance of the role of the follower in the leader-follower relationship, the details of who, how, and when leaders influence others cannot be fully understood.

One unique aspect of Lord and Brown's (2004) theory is that the leadership influence process may operate, in part, outside of the follower's conscious awareness. These authors drew on recent research in social psychology that suggests that images, features of the context, or the presence of significant others can nonconsciously prime particular goals and objectives which motivate behaviour in pursuit of those goals (Shah, 2005). For example, surreptitiously presenting a photograph of a runner winning a race has been found to enhance employee performance, presumably because the covert presentation of an instance of achievement directs employee attention towards the pursuit of achievement in their particular context (Shantz & Latham, 2009). Some researchers have gone so far as to suggest that the preponderance of goal-directed behaviour originates outside of conscious awareness (Bargh, 2006; Baumeister & Masicampo, 2010). Such an assertion has profound implications for leadership. For example, a failure to recognize the role of the nonconscious processes in the study of leader influence may lead, not only to an incomplete understanding of leadership, but to a lack of understanding of what may be a powerful and primary mode of leader influence. That is, the leader may enhance the salience of particular goals outside the conscious awareness of their followers, encouraging them to behave in particular ways without engaging in overt directive behaviours. That leadership research has largely ignored this source of influence suggests that we are far from a complete understanding of the leadership process. In fact, fully appreciating this subtle and unconscious influence process has the potential to produce a profound impact on the study and practice of leadership, and may explain why leadership theories that focus on high-order goals and values like transformational leadership and authentic leadership are so effective (Avolio, 1999; Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Interestingly, these theories are concerned with enhancing follower identification with the leader or group in order to

encourage group concerns over personal interests. Such a process is quite remarkable given the fundamental nature of self-interest.

Critically, self-interest is considered by nearly every theory of behaviour in the social and organizational sciences to be a fundamental motive guiding human behaviour (Miller, 1999). As evidenced by the quotes that lead off this paper, scholars have repeatedly alluded to the possibility that transformational leadership can “move those influenced to transcend their own self-interest for the good of the group.” Despite such widespread acceptance that transformational leaders can powerfully affect followers’ self-interest, evidence for this position, and why it arises, is scant and largely indirect. Examples of this type of research are studies that show that followers of transformational leaders engage in higher levels of organizational citizenship behaviour, which are acts that benefit others in the organization or the group as a whole (De Cremer & Van Knippenberg, 2002; Podsakoff, MacKenzie, & Bommer, 1996). Although this research suggests that transformational leaders are encouraging followers to be prosocial, some have argued that organizational citizenship behaviour can be self-serving, as it is typically rewarded by the organization (Bolino, 1999). Theoretically, researchers have suggested that transformational leaders may increase prosocial behaviour like helping and sharing by encouraging in their followers the activation of an interpersonal or communal identity associated with the leader’s group (D. van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). It is possible that this interdependent self-construal leads individuals to act in their own interest when they serve the interests of the group with which they identify; that is, the behaviour remains self-interested, but the nature of the “self” has expanded to include one or more other individuals as part of a superordinate entity. Because individuals would see other members of that group as extensions of themselves, they may engage in ostensibly altruistic behaviour towards group

members in order to support the group with which they identify in order to promote that group's success, and indirectly, their own success. Thus, the resulting behaviour would appear prosocial, even though it may be self-interested in its origin. In order to disentangle whether transformational leaders inspire authentically prosocial behaviour or collectively self-interested behaviour a dependent variable that gauges followers' self-interest in the absence of reward or identity confounds is needed.

Critically, research has shown that those high in self-interest are more apt to rationally integrate the elements of a decision, while those low in self-interest will tend to use a heuristic approach in the same situation (Meglino & Korsgaard, 2004). For example, when participants are asked how much they would be willing to pay for a lottery ticket with a specific prize value and probability of winning, those high in self-interest offer more than those low in self-interest because the rational integration of the prize and probability factors leads those high in self-interest to generate offers based on the expected value of the ticket, which leads to fairly high offers, whereas those low in self-interest generate offers holistically, leading to lower offers (M. A. Korsgaard, Meglino, & Lester, 1996). In light of this, the present research uses instrumental rationality, or the tendency to rationally integrate elements of a decision, as an indicator of self-interest in order to sidestep reward and identity confounds. Besides serving as a purer indicator of level of self-interest, a change in instrumental rationality will suggest that it is not merely the overt behaviour that changes under the direction of a transformational leader, but the fundamental nature of the follower's decision making process.

In the present research I conduct a series of studies to explore whether followers are nonconsciously influenced by a leader. I chose transformational and transactional leadership as a framework to test this notion. These two leadership styles vary in a number of different ways,

one of which is the extent to which they promote self-interest in followers, with transformational leaders believed to reduce self-interest while transactional leaders instead focus on personal benefit (Bass, 1985; Bass & Riggio, 2005). The present research nonconsciously exposed participants to these two types of leaders and assessed self-interest to investigate whether leaders can activate particular goals that are consistent with their leadership style. In the first study, I investigated the potential for the nonconscious priming of a leader to have an impact on the level of self-interest of participants as indicated by their level of instrumental rationality. Participants were first given images and descriptions of transformational and transactional leaders to review. After ten minutes they were nonconsciously primed with the image of one of the leaders before completing a task in which they made offers on several lottery tickets with differing probabilities of winning and prize values. The results of this study demonstrated both the potential for nonconscious influence, as well as the potential for transformational leaders to affect self-interest. In the second study, I explored the robustness of my findings in the first study by increasing the delay between learning about the leaders and being primed with one of those leaders. The second study also investigated the impact of pre-existing levels of other-orientation on the effectiveness of the leader prime in order to explore the moderating effect of individual differences on leader influence. In the third study, I further explored the robustness of the leader prime through the use of an additional indicator of self-interest, in which participants were asked to choose between maximizing personal or group gains, in order to explore the effectiveness of the nonconscious leader influence process in an alternative context.

In the sections that follow, I describe transformational and transactional leadership, and their unique relationship to self-interest. I then discuss self-interest and how it was evaluated in the current research. I then present a review of conscious and nonconscious cognition, and in

particular, how this nonconscious cognition may be sensitive to leaders as a cue for particular goals. Following this section, I conclude the introduction with an overview of the program of research conducted to investigate this leadership influence process.

Chapter 2

Transformational and Transactional Leadership

Perhaps the most studied of all contemporary leadership theories, transformational leadership theory is highly regarded for its capacity to fully engage followers; to transform their underlying values, beliefs, assumptions, and expectations. By focusing on transcendent goals and far-reaching ideals, transformational leaders can have a significant impact on followers. Over the past 30 years, the construct of transformational leadership has gained enormous popularity among both researchers and practitioners. First introduced by Burns (1978) and later elaborated by Bass (1985), transformational leadership is characterized by a leader's ability to articulate a shared vision of the future, as well as intellectually stimulate and attend to individual differences in followers (Lowe, Kroeck, & Sivasubramaniam, 1996). Research into transformational leadership has demonstrated that follower perceptions of transformational leadership are positively related to a number of important organizational outcomes, including job satisfaction, organizational commitment, motivation, and in-role and extra-role performance, and that these relationships are highly robust, generalizing across organizational levels, cultures, and sample populations (Bass & Riggio, 2005; DeGroot, Kiker, & Cross, 2000; Judge & Piccolo, 2004; Lowe, Kroeck, & Sivasubramaniam, 1996).

In his description of the full-range-of-leadership model, which characterizes leadership in terms of transformational, transactional, and non-leadership, Bass (1998) describes four specific dimensions of transformational leadership. The first component, *idealized influence*, encourages workers to regard the leader as a role model for appropriate behaviour, ultimately inspiring them to identify with, and seek to emulate, the leader. This component is typically bifurcated into two subfactors in contemporary transformational leadership theory: attributed idealized influence

refers to attributions of the leader made by followers based on how they perceive the leader, whereas behavioural idealized influence refers to specific observable behaviours in which the leader engages. Both factors impact a leader's potential for encouraging identification and emulation, although they manifest and are measured differently (Antonakis, 2011). The second component, *inspirational motivation*, captures the communication of an appealing shared vision, inspiring follower effort by providing a meaningful context for their work. The third component, *intellectual stimulation*, works to encourage innovative and creative efforts from followers by increasing follower awareness of problems and influencing them to view those problems from new perspectives. Finally, the fourth component, *individualized consideration*, provides support, encouragement, and coaching to followers with the goal of helping them develop and grow. These components encourage follower identification with the group and model supportive behaviour, which may be expected to enhance the degree of support and prosocial behaviour in followers.

Transformational leadership is typically discussed in contrast to transactional leadership, the second major component of Bass' full-range-of-leadership model. Transactional leaders primarily influence followers by establishing, and then monitoring, a quid pro quo relationship with followers. Effective transactional leadership requires that the leader recognizes follower needs and desires and clarifies how those needs and desires will be met in exchange for the efforts of followers. Although initially conceived to be in opposition to transformational leadership (Burns, 1978), transactional leadership is now regarded as complimentary to transformational leadership, with each of these two disparate leadership styles representing effective leadership behaviour depending on the particular context or desired outcomes (e.g., Avolio, 1999).

Like transformational leadership, transactional leadership is comprised of four components. The first, *contingent reward*, represents the development of exchange relationships of valued resources for follower effort. The second, *management by exception – active*, involves monitoring follower performance with the intention of taking corrective action if deviations from performance standards are anticipated. The third, *management by exception – passive*, also involves corrective action in response to deviations from performance standards, but represents a more reactive orientation; intervention only occurs after problems become serious. Both types of management by exception are concerned with maintaining established exchange relationships and avoiding mistakes. In each case, the focus of the leadership behaviour is the individual follower and the rewards and corrective action taken in response to their individual action. This focus on the individual may enhance pro-self cognition and behaviour, that is, thoughts and behaviours that primarily consider only the self and that are aimed at benefitting the self. Finally, the last component of transactional leadership is *laissez-faire* leadership, or nonleadership, which captures the leader's avoidance of leadership duties and responsibilities.

Judge & Piccolo (2004) conducted a meta-analysis of transformational and transactional research to compare their validity for predicting a number of important organizational outcomes. Transformational leadership was found to positively predict follower job satisfaction, follower satisfaction with their leader, follower motivation, leader job performance, group or organization performance, and leader effectiveness. Interestingly, the contingent reward facet of transactional leadership was also positively related to all of these outcomes, showing significantly stronger relationships with measures of follower job satisfaction and leader job performance, but significantly weaker relationships with measures of follower satisfaction with the leader and leader effectiveness. The active management by exception facet of transactional leadership was

modestly positively related to follower satisfaction with the leader, follower motivation, leader job performance, and leader effectiveness, while the passive management by exception facet was negatively related to follower motivation, group or organization performance, and leader effectiveness. The mixed results for transactional leadership at the facet level may explain the weak relationship between transactional leadership and various organizational outcomes in the empirical literature (e.g., Gellis, 2001; Wofford et al., 1998), and suggests that elements of transactional leadership can promote positive organizational outcomes.

Critically, transformational and transactional leadership do appear to lead to disparate performance outcomes. For example, given a task where participants were asked to brainstorm solutions to a problem, individuals led by a transformational leader produced more innovative and higher quality recommendations than those led by a transactional leader, whereas those individuals led by a transactional leader produced a larger quantity of suggestions compared to those led by a transformational leader (Jung & Avolio, 2000; Hoyt and Blascovich, 2003). Additionally, the performance of followers whose leaders emphasized the quantity and level of quality of work to be accomplished (i.e., transactional leadership) was negatively affected by a lack of performance feedback, whereas the performance of followers whose leaders emphasized an ideological goal in articulating the same task (i.e., transformational leadership) was unaffected by a lack of performance feedback (Shea & Howell, 1999). Context may help determine the relative effectiveness of these two leadership styles. For example, a workplace with a mature and highly structured set of policies and procedures as well as a low level of group cohesiveness may benefit from a leader with a transactional style, whereas a workplace with a strong support for innovation and a high level of group cohesiveness may benefit from a leader with a transformational style (Elenkov, 2002).

While leaders may be capable of enhancing the salience of a wide range of goals consistent with any number of outcomes, transformational leadership scholars assert that transformational leaders, as opposed to their transactional counterparts, should reduce self-interest in their followers. Replacing self-interest with a focus on the welfare of the group is a characteristic goal change that is unique to the transformational leadership style (Bass, 1985; Conger & Kanungo, 1998). For example, De Cremer and van Knippenberg (2002) found that participants were willing to contribute more of their resources when they believed that a sacrificing leader (i.e., a leader who puts the goals of the group ahead of their own interests, consistent with transformational leadership) was making final decisions for the distribution of rewards for a group cooperation task compared to those participants who believed that a self-benefiting leader (i.e., a leader who is primarily concerned with maximizing their own outcomes in exchange relationships, consistent with Burns's (1978) conception of transactional leadership) was serving in this role.¹ Because a reduction of self-interest is argued to be uniquely associated with transformational leadership, it is an ideal candidate for investigating whether particular leadership styles prime particular goals. Additionally, because self-interest may have a profound impact on the nature of an organization and the behaviour of its employees, exploring this fundamental association between transformational leadership and self-interest represents one of the primary goals of the present research.

Self-Interest

Self-interest is the motivation to benefit the self. These benefits may be tangible (e.g., money), but may also be intangible (e.g., pleasure, status). Self-interest is considered by nearly

¹ It is worth noting that, as with most cooperation tasks of this nature, a greater contribution of resources can lead to optimal outcomes for the individual provided others are doing the same. Thus, for this task, participants may still be acting in self-interest when contributing to the "common good."

every theory of behaviour in the social and organizational sciences (Miller, 1999), economics and philosophy (e.g., Cropanzano, Stein, & Goldman, 2007), and evolutionary biology (B. Schwartz, 1986) to be a fundamental motive guiding human behaviour. Miller (1999) argues that self-interest is also a powerful social norm, such that individuals believe that they should make decisions and act in ways that promote their own self-interest. Whether a particular choice conforms to their own level of self-interest or not, people generally believe failure to endorse self-interested behaviours may provoke suspicion or derogation from others, which leads them to behave in ways that maximize their self-interest (Ratner & Miller, 2001). That transformational leaders may be capable of changing such a fundamental part of human nature is quite remarkable indeed.

Interestingly, while there is certainly ample evidence that humans do act in ways that maximize their personal benefit, whether due to an innate preoccupation with their own personal gain, or because they believe self-interest is normative, doubts have always accompanied theories of universal self-interest (Cropanzano, Stein, & Goldman, 2007). In recent decades, behavioural scientists in a number of fields have contributed empirical support to these doubts. Management scientists (e.g., De Dreu, Carsten K. W., 2006; Ferraro, Pfeffer, & Sutton, 2005; Folger, 2001; Folger & Salvador, 2008), social psychologists (e.g., Batson, 1995; Batson, 1998; Batson, 2006; Lerner, 1982; Lerner, 2003), economists (e.g., Camerer & Fehr, 2006; Sen, 1977; Simon, 1990; Simon, 1993), and political scientists (e.g., Mansbridge, 1990) have come to the conclusion that, while self-interest may represent an important human motive, perhaps even the strongest, it is insufficient to explain all of human behaviour.

Research shows that there is variability in the extent to which people will behave in a self-interested manner depending on individual differences and situational characteristics. For

example, research by Kahneman, Knetsch and Thaler (1986) demonstrated that people do not typically try to maximize their individual wealth at the expense of others. These authors conducted a study with psychology and commerce students using the ultimatum game, where one participant decides how to distribute a valuable resource (say, \$20) between him- or herself and a second participant, who then decides whether to accept the offer. The optimal (self-interested) offer is \$1, since it maximizes the outcomes for the participant giving the ultimatum, and the second participant is compelled to accept since \$1 is better than the alternative (i.e., \$0). Of the offers made by psychology students, 81% were even splits (i.e., \$10 for each participant), a result decidedly inconsistent with the self-interest prediction of a single dollar. Commerce students proposed even splits to psychology students 63% of the time, suggesting that educational or dispositional background can affect self-interested behaviour. In another version of this game, dubbed the dictator game, the second participant has no choice but to accept any offer. While this game results in lower offers to the second participant than the ultimatum game, there is considerable variability in the extent to which participants exhibit self-interest (Camerer & Thaler, 1995) .

One particularly noteworthy set of dictator game studies attempted to explore the role of social distance on offers made by participants by changing elements of the experimental procedure (Hoffman, McCabe, & Smith, 1996). When, experimenters chose the role of distributor through merit (i.e., through a trivia contest), provided a plausible explanation for an allocation of zero dollars (i.e., by giving some participants in the dictator role only slips of paper, not money, to distribute; these dictators could not make a non-zero offer), included a number of measures to ensure anonymity, and described the task as a transaction with a buyer and a seller (as opposed to a distribution of a common resource), about 65 percent of participants kept all the

money for themselves. In the absence of one or more of these elements, the offers grew; each element of the altered design appeared to have an effect on perceptions of social distance, and ultimately, the incidence of self-interested behaviour. The last element, (i.e., describing the task as a transaction as opposed to a distribution of a common good), is particularly germane to the present discussion as it suggests that contextual information that implies a transactional relationship (e.g., between a transactional leader and their followers) can enhance self-interested behaviour, compared to contextual information that implies a communal relationship (e.g., between a transformational leader and his/her followers).

Indeed, transformational leadership scholars have argued that transformational leaders reduce self-interest among their followers. Although prominent theorists have argued that transcending self-interest in followers is a hallmark of transformational leaders (e.g., Bass, 1985; Conger & Kanungo, 1998), there is no direct evidence to support this claim. Finding evidence for this claim is difficult, because behaviour that might appear to be prosocial on the surface, might actually be driven by self-interested motives. For example, transformational leaders might encourage their followers to engage in more prosocial behaviour directly, by praising and rewarding those individuals who serve the interests of the group, and indirectly, by creating a work environment that is highly conducive to engaging in prosocial behaviour. Followers seeking to maximize their personal outcomes in such a context would do well to work towards the good of the group, appearing to be prosocial regardless of their level of self-interest (Avolio, 1999).

Alternatively, transformational leaders may encourage the activation of an interpersonal or communal identity associated with the leader's group in their followers (D. van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). That is, the nature of followers' self-concept

changes from being defined as an isolated individual to being defined as a member of the group. This interdependent self-construal leads individuals to act in their own interest when they serve the interests of the group; that is, the behaviour remains self-interested, but because the nature of the “self” has changed to a more communal identity, prosocial behaviour is actually self-beneficial. This is not technically inconsistent with the position offered by Bass, Avolio, Conger, and Kanungo in their respective papers (Bass, 1985; Conger & Kanungo, 1998). Indeed, the resulting behaviour would appear prosocial, even if it were self-interested in its origin.

Another alternative based on work by Shah (2003) argues that transformational leaders may influence their followers by priming goals and behaviours related to promoting and supporting others (i.e., prosocial behaviour). Because the transformational leader can both serve as a role model for prosocial behaviour as well as facilitate such behaviour directly (Avolio, 1999), he or she may become associated with the concept of prosocial behaviour. As a result, merely being reminded of the transformational leader brings prosocial concerns to mind, thereby encouraging followers to consider others when choosing behaviours or making decisions. Transactional leaders, on the other hand, may be expected to increase self-interest in followers, because these leaders focus on individual performance and rewards.

Indirect evidence that transformational leaders reduce self-interest comes from studies that show that followers of transformational leaders engage in higher levels of organizational citizenship behaviour, which are acts that benefit others in the organization or the group as a whole (De Cremer & Van Knippenberg, 2002; Podsakoff, MacKenzie, & Bommer, 1996). Although this research suggests that transformational leaders are encouraging followers to be prosocial, some have argued that organizational citizenship behaviour can be self-serving, as it is typically rewarded by the organization and is thus a self-interested behaviour (Bolino, 1999).

What is needed to test this claim about transformational leaders is a dependent variable that gauges followers' self-interest without directly measuring helping behaviour, because, as discussed above, behaviour that appears to help the members of one's group could actually be driven by self-interested motives. Researchers have used an activity called a lottery task for this purpose. The lottery task is a decision-making task in which participants are presented with nine scenarios. In each scenario, participants are asked to assume that they can purchase a lottery ticket with a particular chance of winning a specific prize amount. The scenarios vary both in the probability of winning (10% chance, 50% chance, or 90% chance) and in the amount of the prize (\$10, \$100, or \$300. Participants are asked to report how much they are willing to pay for each lottery ticket (M. A. Korsgaard, Meglino, & Lester, 1996). This task assesses instrumental rationality, which is a "symptom" of self-interest. According to Meglino and Korsgaard (2004) and Simon (1990; 1993), when engaged in decision making about various courses of action, persons higher in self-interest should be more aware of and/or more likely to consider potential personal consequences of those courses of action as opposed to persons with lower self-interest, who tend to use a more heuristic decision making strategy. These authors argue that those low in self-interest often use social information to make decisions, accepting that what works for other people will probably work for them. By their nature, these individuals are less likely to engage in extensive deliberate cost/benefit analysis of various courses of action because they are generally more concerned with others than with their own personal gain. Self-interested people, on the other hand, should be more inclined to carefully evaluate different options in a calculating or rational manner by weighing valences of outcomes by their belief in the instrumentality of a course of action. As such, those higher in self-interest will exhibit instrumental rationality by calculating how much they would be willing to pay for each lottery ticket and carefully adjusting

their payments according to the changing dollar value and probability of each ticket, while those lower in self-interest will be less sensitive to the ticket values. Thus, responses that are consistent with a deliberative and calculative approach to decision making that maximizes personal gain are indicative of greater self-interest, while those who are more prosocial use a heuristic decision making strategy, which generally results in lower proposed prices for the lottery tickets (M. A. Korsgaard, Meglino, & Lester, 1996). This task, used in the present research, simplifies the operationalization of self-interest by presenting a straightforward, non-helping situation (c.f., D. van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004).

Dual-Process Cognitive Systems

There is a growing body of research that suggests that human mental operation is bifurcated into two systems: a conscious, rule-based, or symbolic system, and an unconscious, heuristic, or associative system (Sloman, 1996). Dual-process systems have been applied to the understanding of a wide range of psychological phenomena such as persuasion (Petty & Cacioppo, 1986), motivation (Strack & Deutsch, 2004), and judgment (Kahneman & Frederick, 2005). Leadership researchers, on the other hand, have been slow to consider the implications of dual-process systems for the leadership influence process, tending to view leader influence as a highly conscious process (Brown, 2012). Because leader influence likely unfolds both consciously and unconsciously, this lack of attention represents a significant gap in our understanding of leadership. In the present section, I will describe the characteristics of each system, with particular attention to the contribution of the unconscious (associative) system to the leadership process.

One of the major goals of the human mind is to build a representation of the world around us to permit us to best navigate it. Characteristics of the world, both concrete and

abstract, are collected, organized, and deployed in order to accomplish this goal. The ideal system is capable of both rapidly acquiring new knowledge (e.g., after a single encounter), and rapidly considering the vast array of knowledge previously acquired. In the human mind, such an ideal is accomplished through the complementary functions of both a conscious symbolic system and an unconscious associative system (E. R. Smith & DeCoster, 2000; Strack & Deutsch, 2004).

Considered to be restricted to the human species (Evans, 2008), the conscious or symbolic mind is a rule-based system in which concepts are labelled (i.e., symbolic) and their relationships are semantic and rule-based, forming propositions (e.g., “good leaders take care of their subordinates;” (Strack & Deutsch, 2004). Information can be acquired rapidly (e.g., richly encoding specific experiences with contextual detail), and the resulting propositions can be tested for validity using syllogistic reasoning (e.g., “good leaders take care of their subordinates; my supervisor takes care of me, therefore he or she is a good leader”), but this rapid acquisition comes at the cost of being slow and cumbersome when it comes time to use that information, and very demanding in terms of motivation and attention (E. R. Smith & DeCoster, 2000). In contrast, the unconscious or associative mind develops relationships between knowledge structures slowly and incrementally such that they form a robust representation of the world based on typical characteristics. Once this mental representation has been established, this system can use that knowledge to fill in missing information rapidly and automatically about the current situation based on similar characteristics of situations previously experienced. This mode of mental processing requires little in the way of attention and motivation, instead unfolding automatically and outside of conscious awareness or control. Indeed, pattern recognition of superficial similarities is sufficient for the associative processing system to activate or inhibit

associated knowledge structures (E. R. Smith & DeCoster, 2000). For example, libraries contain stacks of books and people are quiet in libraries. A room outside of a library that also contains stacks of books may also elicit quiet speaking. The symbolic and associative systems operate largely independently, although they can interact; rational considerations by the symbolic system can be biased by the associative system (Strack & Deutsch, 2004), and the structure of the associative system can be affected through repeated use of the symbolic system to consider a particular set of propositions, a process referred to as consolidation (E. R. Smith & DeCoster, 2000). For example, people may hold a stereotype about a certain group of people that will bias their behaviour toward members of that group. Over repeated exposure to individuals from that group who violate the stereotype may lead to changes in the structure of the associative system relating to that group.

As mentioned above, there is an assumption of conscious and explicit influence in the leadership literature, that is, overt and conscious behaviours on the part of the leader are assumed to result in overt responses on the part of their followers. Interestingly, research suggests that consciousness may represent the minority of human cognition, with the majority occurring unconsciously in the associative system. For example, the mind of a non-sleeping human is bombarded with an estimated 11,000,000 bits of sensory information, only about 40 of which can be handled by the conscious mind, leaving the preponderance of that information to the unconscious mind (Nørretranders, 1998; Wilson, 2002). Additionally, the mind contains a vast array of information (e.g., schemas, goals, beliefs), of which only a very small subset is active in the conscious mind (Wilson, 2002). When individuals make choices or engage in behaviours, they can be guided by both conscious deliberations and unconscious associations. While the conscious mind can maintain executive control, or veto power, over choices and behaviours, the

unconscious mind appears to initiate the process of choosing or behaving before the conscious decision to do so (Libet, 1985; Libet, 2004). Furthermore, the conscious mind is implicated in only a modest percentage of human decisions and behaviours, leaving the unconscious associative system to handle the bulk of this responsibility (Bargh, 1997; Bargh, 2006). Given this disparity in functional capacity and control, there is tremendous potential for leaders to influence their followers unconsciously, through their associative system.

Priming. The activation of cognitive structures through an external stimulus is often referred to in contemporary research on implicit influence as *priming* (Kunda, 1999). The increased activation of a particular knowledge structure amplifies its impact on an individual's behaviour and perceptions (Higgins, 1996). Essentially, the associative system can develop relationships between particular knowledge structures and external stimuli through repeated simultaneous activation, and the mere presence of an external stimulus in a given context is sufficient to increase the activation of any knowledge structure associated with it (Bargh & Barndollar, 1996). For example, the presentation of a picture of a library (external stimulus) can enhance the accessibility of library-relevant concepts (e.g., "quiet"), and the presentation of a picture of an upscale restaurant can enhance tidiness, operationalized as cleaning up after consuming a crumbly cookie (Aarts & Dijksterhuis, 2003). Interestingly, individuals primed in this way are typically not aware of the influence of these external cues on their cognition and behaviour, and these cues can be effective even when presented outside of conscious awareness, for example, if a word or image is presented at a speed that is too fast for the conscious system to identify (Shah, 2005). Critically, leaders can be used to produce a priming effect. For example, research by Brown (2000) found that visualizing a leader produced changes in affect, motivation, and self-esteem consistent with the form of relationship that a subordinate had with his/her

supervisor. Similarly, Paul, Costley, Howell, Dorfman, and Trafimow (2001) found that priming participants with a charismatic leader encouraged them to provide a significantly greater number of communal self-descriptions.

Research on priming suggests that individuals are sensitive to other people (e.g., leaders) as both instrumental primes and interpersonal primes (Shah, 2005). With respect to instrumental primes, because goals can become associated with particular settings, people, or behaviours that facilitate attainment of that goal, encountering (or engaging in) these instrumental factors will automatically activate the associated goal (e.g., Shah & Kruglanski, 2000). For example, a teacher is associated with learning, so the presence of a teacher may prime a goal to learn or acquire knowledge. Interpersonal primes occur when an individual encounters a person of importance to him/her. Priming a person of importance will enhance the salience of goals that person endorses and inhibit the salience of goals that person admonishes (Shah, 2005).

Leaders could function either as instrumental or interpersonal primes for goals, but it is likely that they are both, making them highly likely to serve as an effective prime for goals in a workplace context. Leaders can be an instrumental prime because leaders can directly impact or facilitate goal attainment by assigning goals, controlling rewards and punishment, and allocating resources. Because leaders themselves exemplify a successful performer for their group (i.e., role model with high status), they likely represent a particularly striking instrumental prime for goals consistent with their attitudes and behaviours. Note that in each case, the leader acts to facilitate the attainment of the goal in question by directly or indirectly encouraging the desired goal or end state, which in turn can make those goals more salient when the leader is present (Shah & Kruglanski, 2002). For example, a study by Davison, Cutting & Birch (2003) found that parents

who both provide logistic support for good exercise behaviour and model good exercise behaviour had children with better fitness habits than parents who did not.

Alternatively, followers are likely to view their leader as a person of importance (i.e., significant other), and thus the leader's presence serves as an interpersonal prime capable of increasing the salience of goals and ideals associated with their leader. For example, priming students with the concept of their own mother can significantly increase their performance on an academic achievement task compared to a no-prime control group, but only if the students' reported a goal to achieve academically to please their mothers (Fitzsimons & Bargh, 2003). Interestingly, the authority figure need not be someone with whom the follower has a direct relationship. For example, Baldwin, Carrell, and Lopez (1990) primed Catholic students with one of two disapproving faces: either Pope John Paul II or an unfamiliar other. Practicing Catholic students rated themselves more negatively after being subliminally primed with a frowning picture of the Pope (an arms-length figure of authority among Catholics) than when primed with the frowning picture of an unfamiliar other.

Lord and Brown (Lord, Brown, & Freiberg, 1999; Lord & Brown, 2004) argue that because high-order goals and ideals tend to be internalized and unquestioned, the priming of the particular goals and ideals the leader represents can result in a fundamental shift in the behaviour of a subordinate, especially in the case of repeated priming. Through this mechanism, over time, a leader can inspire followers to adopt a set of goals that are in accordance with the ideals the leader facilitates or endorses. In the present research, I explore this phenomenon using transformational and transactional leaders. These leadership styles are an apt choice to study unconscious influence because they are both highly effective leadership styles when used appropriately but differ in some fundamental ways. Transformational and transactional

leadership should be differentially associated with self-interest, and so examining both styles in the same paradigm will permit a test of whether leaders prime self-interest in their followers consistent with the leader's attitudes and behaviour.

Summary of the Current Research

The test of leadership is not to put greatness into humanity, but to elicit it, for the greatness is already there. (James Buchanan)

[P]ersuasion may come through the hearers, when the speech stirs their emotions.

Our judgments when we are pleased and friendly are not the same as when we are pained and hostile. It is towards producing these effects, as we maintain, that present-day writers on rhetoric direct the whole of their efforts. (Aristotle, ~450 B.C.E; trans., 1954)

The present series of studies seeks to make several contributions to the understanding of leadership. It is among the first to apply priming research to leadership to answer the question of whether leaders influence followers outside of their awareness. Leadership research (and, indeed, psychological research in general) has long assumed that human behaviour is the result of a rational and explicit cognitive process, however, recent research in social psychology suggests that the preponderance of goal-directed behaviour originates outside of conscious awareness. This suggests a powerful and primary mode of influence through which leaders can encourage the pursuit of strategic objectives which has been neglected by the leadership literature. In the studies that follow, I explore this subtle and unconscious influence process in order to reduce this gap and inform the science and practice of leadership. Additionally, while leadership research has predominantly focused on the leader's traits and behaviours and their relationship to easily observable follower outcomes, in this research I acknowledge the subjective nature of leader

influence by exploring how particular followers react to the leader's traits and behaviours; a second significant gap in our understanding of the leadership process. Finally, in the present research I also investigate the link between transformational and transactional leadership and self-interest, which, while often discussed, has not previously been tested. Self-interest is theoretically negatively related to transformational leadership and positively related to transactional leadership. Demonstrating such a relationship empirically may help to explain why transformational leaders give rise to the particular outcomes (e.g., an increase in organizational citizenship behaviours) that have been associated with this leadership style.

In the first study, I investigate the potential for the unconscious priming of a leader to have an impact on the level of self-interest of participants using the lottery task to assess self-interest. Participants were given images and descriptions of transformational and transactional leaders to review, and after ten minutes were nonconsciously primed with the image of one of the leaders and then completed the lottery task. In the second study, I explored the robustness of my findings in the first study by increasing the delay between learning about the leaders and being primed with one of those leaders. The second study also investigated the impact of pre-existing level of other-orientation on the effectiveness of the leader prime. In the third study, I further explored the nature of the leader prime through the use of an additional indicator of self-interest, in which participants are asked to choose between maximizing personal or group gains, in order to explore the effectiveness of the unconscious leader influence process in an alternative context.

Chapter 3

Study 1: Single-session Nonconscious Prime

The goal for Study 1 was to investigate whether the nonconscious presentation of the image of a transformational and transactional leader can encourage individuals to be more or less self-interested in their decision making. Following Lord and Brown's (2004) theory, I argue that this influence process comes about because leaders are an important "contextual cue" in organizations, and human cognition is adaptive to contextual cues. Alternatively, one could argue that followers adopt goals that are in line with the leader's traits and behaviours not because of a nonconscious priming process, but because the followers that leaders hire have concordant traits or because the leader imposes structure and guidelines that direct follower behaviour. More specifically, leaders may attract and select individuals who are similar to them in terms of traits and behavioural tendencies, and/or may explicitly establish the terms for effective or acceptable performance, which may include expectations for how self-interested followers should be. Although these processes are likely also at work in organizations, my goal was to study the nonconscious priming process. To rule out these alternative explanations, participants in the present research read two brief written descriptions of unfamiliar leaders. Participants were then primed with one of those leaders and asked to respond to a lottery decision task in order to assess their level of self-interest. Because they did not interact with the leaders in a real organization setting, these alternative attraction/selection and structural explanations would not apply, and any effects of the leader on participants would be due to priming. Because those high in self-interest tend to have a higher level of instrumental rationality, i.e., to use a rational integration of beliefs (e.g., probability and prize value) in order to make decisions (Meglino & Korsgaard, 2004; Simon, 1990; Simon, 1993), participants high in

self-interest will be more sensitive to increases in probability of winning and prize value, resulting in higher offers compared to those low in self-interest.

Hypothesis 1: Participants primed with a transformational leader will have lower self-interest as evidenced by a weaker effect of probability of winning and prize value on lottery ticket offers compared to those primed with a transactional leader.

Method

Participants. The sample consisted of 92 undergraduate students (37 males, 55 females) enrolled in an introductory psychology course at the University of Waterloo. In exchange for their participation, participants received 1 extra credit point towards their introductory psychology class grade.

Procedure. Participants were recruited to participate in a study that was designed, ostensibly, to pilot test materials for future investigations. Participants first completed the leader impression formation task, which involved reading descriptions of both a transformational and transactional leader and responding to questions about those leaders. They were then asked to complete a series of filler tasks (i.e., unrelated questionnaires) for 10 minutes, after which they were asked to complete the computer priming task, through which they were primed with the picture of one of the two leaders.

Immediately following the prime participants completed nine lottery scenarios (Mano, 1992), previously used in self-interest research (M. A. Korsgaard, Meglino, & Lester, 1996), in which they indicated how much they were willing to pay for tickets that varied both in terms of their dollar value and the probability of winning. Finally, participants were thanked for their participation and fully debriefed.

Stimuli and Measures

Leader impression formation task. Two leader descriptions were developed for this study, one intended to describe a transformational leader, and another intended to describe a transactional leader. Each description included information about a manager's leadership style. Using behaviours derived from a previously established instrument (i.e., Multifactor Leadership Questionnaire (MLQ); Bass & Avolio, 1990), one of the managers was described using a list of 10 transformational behaviours, while the second manager was described using a list of 10 transactional behaviours (see Appendix A).² One of two pictures of a male³ was presented above each description, and the presentation of each picture was counterbalanced between the two leader descriptions.⁴ Participants were given three minutes to read each description (i.e., 6 minutes in total) and then complete an evaluation for each of the two leaders. The evaluation asked participants to recall three of the ten behaviours they remember the leader performing, asked for their thoughts and impressions of that leader, and then asked them to fill out four items from the transformational leadership dimension of the MLQ (see Appendix B). The goal of the

² A pilot test was conducted in which 63 participants were asked to report the values held by each of the two leaders based on the descriptions used in this study. Values were measured using both the Schwartz Values Survey (9 point scale) and the Portrait Values Questionnaire (6 point scale). Scores were participant-mean centered. Participants rated the transformational leader significantly higher on self-transcendent values ($M_{SVS}=1.40$, $sd_{SVS}=1.16$, $M_{PVQ}=1.06$, $sd_{PVQ}=.69$) compared to the transactional leader ($M_{SVS}=-2.06$, $sd_{SVS}=1.33$, $M_{PVQ}=-1.31$, $sd_{PVQ}=.83$; $t_{SVS(62)}=12.33$, $p<.01$, $t_{PVQ(62)}=13.38$, $p<.01$), and rated the transformational leader significantly lower on self-enhancement values ($M_{SVS}=-.26$, $sd_{SVS}=.72$, $M_{PVQ}=-.73$, $sd_{PVQ}=.88$) compared to the transactional leader ($M_{SVS}=.81$, $sd_{SVS}=.98$, $M_{PVQ}=.79$, $sd_{PVQ}=.88$; $t_{SVS(62)}=6.07$, $p<.01$, $t_{PVQ(62)}=7.87$, $p<.01$). Thus the transformational leader description was more highly associated with (and so more likely to prime) self-transcendence while the transactional leader description was more highly associated with self-enhancement.

³ Research suggests that the leader concept is more strongly and consistently activated for male leaders than for female leaders (Scott & Brown, 2006). In particular, while communal and agentic males and communal females may unconsciously activate the leader prototype and thus be regarded as prototypically leader-like, agentic females appear to be more weakly associated with the concept of leadership. In order to enhance the consistency of the strength of the leader prime for both the transformational and transactional conditions, only pictures of males were used to prime leadership.

⁴ There was no effect for the order in which descriptions and pictures were presented and so this factor is not discussed further.

evaluation was to give participants the opportunity to consider the unique characteristics of each leader in order to facilitate forming a robust impression of each leader.

Manipulation check. To assess the degree to which participants perceived each of the stimulus leaders as transformational, four items were drawn from the MLQ (see Appendix B). As part of the evaluation component of the impression formation task, participants rated each of the leaders on each of the four MLQ items in terms of how strongly they believed that the item described the individual in question. For each item, participants responded on a 5-point Likert scale that was anchored from 1 “Strongly Disagree” to 5 “Strongly Agree”.

Computer priming task. The computer priming task was ostensibly presented as an "object recognition task." Participants were shown pictures of 15 common everyday objects and asked to identify, in writing, the name of each object. The pictures were presented under conditions ostensibly designed to increase the difficulty of the task. In truth, the picture was presented at 16ms, a speed too fast for conscious recognition of the content presented, and immediately followed by a mask of coloured shapes to further interfere with conscious recognition. The picture of one of the leaders presented in the leader descriptions appeared 10 times during this task; the other 5 pictures were of neutral everyday objects (e.g., an umbrella). Prior research has shown that these priming manipulations both activate the mental representation of a significant other (e.g., person schema) and activate the social categories, goals, values, and behaviors that a perceiver holds in relation to a given target (e.g., Fitzsimons & Bargh, 2003). For instance, Shah (2003) found that nonconsciously presenting the name of a person with whom the participant had a close relationship (e.g., parent or friend) led to greater pursuit of the goals that person held for the participant. In essence, this technique works by

activating the person schema that is held in memory for that person as well as the goals and values with which they are associated.

Lottery task. The lottery task is a decision-making task in which participants are presented with nine scenarios. In each scenario, participants are asked to assume that they can purchase a lottery ticket with a particular chance of winning a specific prize amount. The scenarios vary both in the probability of winning (10% chance, 50% chance, or 90% chance) and in the amount of the prize (\$10, \$100, or \$300) and are presented in a random order that is consistent across all subjects. Participants are asked to provide a dollar amount representing how much they are willing to pay for each lottery ticket. This task has been used in previous research to assess self-interest (M. A. Korsgaard, Meglino, & Lester, 1996). The lottery task is presented in Appendix E.

The instrumental component of rational self-interest suggests that individuals are driven to behave in ways that maximize their personal gains from a transaction (Meglino & Korsgaard, 2004). In each lottery scenario, the probability of winning represents the belief that engaging in a particular action (i.e., buying a lottery ticket) is associated with a particular outcome (i.e., winning the prize amount), while the value of the prize represents the valence associated with that outcome. Because the task required participants to make judgments of attractiveness that involved integrating beliefs with valent outcomes, it captures the essential element of instrumental rationality. This task simplifies the measurement of self-interest by offering a non-complex, non-helping situation in which individuals are asked how much of their own personal resources (money) they are willing to risk in order to achieve a potential gain in those resources. Those who are high in self-interest tend to have a higher level of instrumental rationality, i.e., to use a rational integration of beliefs (e.g., probability and prize value) in order to make decisions

(Meglino & Korsgaard, 2004; Simon, 1990; Simon, 1993). Thus, participants high in self-interest will be more sensitive to increases in probability of winning and prize value, resulting in higher offers compared to those low in self-interest.

Results

Manipulation check. As an initial step, I examined individuals' ratings on the MLQ to determine whether the leader descriptions were successful in manipulating participants' perceptions of transformational and transactional leadership. Overall, results indicated that the transformational leader was rated to be significantly more transformational than the transactional leader ($M_{TransformationalOfTransformational} = 4.53, sd = .45, M_{TransformationalOfTransactional} = 1.84, sd = .66; t_{(91)} = 25.81, p < .001$).

SEM Latent Curve Model Lottery Task. Traditionally, results of the lottery task are analyzed using a mixed ANOVA (M. A. Korsgaard, Meglino, & Lester, 1996). Unfortunately, the parametric nature of this analysis technique makes statistical assumptions about the nature of the relationship between different levels of probability and prize value that may not reflect the perceptions of participants, i.e., that the effect of increasing probability and prize value, as well as their joint effect, is linear in nature. While the probabilities used in this study appear equally distributed (i.e., 10%, 50% and 90%), prospect theory suggests that outcomes with low probabilities of occurring may be seen as more costly than the implied expected utility of that probability (Kahneman & Tversky, 1979), suggesting a nonlinear relationship for probability levels in this study. Additionally, the levels of the prize variable, chosen for consistency with previous research (M. A. Korsgaard, Meglino, & Lester, 1996; Mano, 1992) likewise present a nonlinear prize value relationship. It is possible that the first increase in value, from \$10 to \$100 may be larger than the second, from \$100 to \$300, as the first increase represents a ten-fold

increase in prize value while the second represents only a three-fold increase in prize value. In absolute terms, this relationship is reversed; the initial increase (from \$10 to \$100) is \$90 compared to \$200 for the second increase in prize value (from \$100 to \$300). By using structural equation modelling with a freed loading model to estimate the effect of probability and prize value, as well as their joint effect, the assumption of a linear relationship can be relaxed in order to better characterize nonlinear relationships in the lottery task data (c.f., Bollen & Curran, 2006).

For this analysis, responses to lottery task items are used as indicators of a latent trajectory model that characterizes the relationship between probability of winning and prize value. One latent factor represents the intercept component of the trajectory model. Participant responses to each level of probability become indicators of a “shape” factor characterizing the effect of probability, with the loadings for the middle level (50%) determined empirically by the data. Likewise, participant responses to each level of prize become indicators of a “shape” factor characterizing the effect of prize value with the loadings for the middle level (\$100) determined empirically by the data. Additionally, a fourth latent factor characterizing the joint relationship of probability and prize value is estimated (see Figure 1).⁵

This model fit the data well, producing a chi-square of 49.649 ($df = 29$), $p = .01$, a CFI of .979, and a RMSEA of .088, and provided a significant improvement in fit over a model where the relationship between prize and probability, as well as their interaction, was assumed to be linear.⁶

⁵ The inclusion of a fourth factor is critical to creating a well-fitting model to characterize this data. A model consistent with the one described here but without this joint factor produces a chi-square of 711.853 ($df=38$, $p<.000$), a CFI of .327, and a RMSEA of .441, indicating very poor fit.

⁶ In order to test the linear model, factor loadings for probability were set to 0, .5, and 1 for 10%, 50% and 90% probabilities, respectively. Likewise, factor loadings for prize value were set to 0, .5, and 1 for \$10, \$100, and \$300 prize values, respectively. The probability x prize interaction was modelled using zeros for all 10% probabilities and \$10 prize value factor loadings, .25 for the 50%/\$100 factor loading, .5 for the 50%/\$300 and 90%/\$100 factor loadings, and 1 for the 90%/\$300 factor loading; this represents a multiplication of corresponding

The factor loadings for lottery task responses on the four latent factors are presented in Table 1. Consistent with a latent growth curve modelling analysis procedure (Bollen & Curran, 2006), all factor loadings for the intercept were set to 1 (Table 1-Intercept). Factor loadings for the prize factor across all levels of probability were set to 0 and 1 for the lowest (\$10) and highest (\$300) prize levels, respectively. The factor loading for the middle prize level (\$100), determined by the data but constrained to be equal across probabilities, was .317 (see Table 1-Prize). This indicates that the effect of the middle prize level was roughly one-third (31.7%) as influential as the highest prize level; in a linear model (e.g., ANOVA), one would expect the middle level to be 50% as influential.

Factor loadings for the probability factor across all levels of prize were set to 0 and 1 for the lowest (10%) and highest (90%) probability levels, respectively. The factor loading for the middle probability level (50%), determined by the data but constrained to be equal across prize levels, was .365 (see Table 1-Probability). This result indicates that the effect of the middle probability level was roughly one-third (36.5%) as influential as the highest probability level.

Factor loadings for the factor characterizing the prize by probability interaction were set to 0 for the lowest levels of prize and probability (i.e., all factors for which prize = \$10 and/or probability = 10%) and 1 for the highest level of probability and prize (i.e., for the 90% probability, \$300 prize indicator). The factor loadings for the other three indicators were determined by the data and not constrained to be equal (see Table 1-Prize x Probability). Results suggest a synergistic interaction between probability and prize such that participants are willing

combinations of first-order factor loadings for proportion and prize value. Fit for this model indicated poorer fit than a freed-loading model, producing a chi-square of 214.640 ($df = 34$), $p = .000$, CFI of .820, and RMSEA of .242. A test of the difference between these nested models indicated a significant improvement of fit through the freed-loading model (chi-square difference = 164.991 ($df = 5$), $p < .001$).

to pay more for lottery tickets when both the probability of winning and the prize for winning are large, over and above the first-order effect of prize and probability alone.

The effect of probability and prize value, as well as their joint effect, for the reference group (i.e., group dummy coded 0) is captured by the value of the intercept for each of the corresponding latent factors presented along the bottom of Figure 1. In this case, the transformational leader prime condition serves as the reference group. The effect of the transactional leader is reflected in the coefficients for the paths linking the transactional leader factor to the latent factors in Figure 1. The effect of the transactional prime is characterized by the sum of the intercept value and the path value for each latent factor. The intercept values, representing the effect of the transformational prime, as well as the sum of the intercept values and the path values, representing the effect of the transactional prime, appear in Table 2.

Participants primed with a transformational leader were willing to pay an average of 81.8¢ for a lottery ticket with a 10% chance of winning \$10. A higher probability of winning produced a modest effect, increasing the amount participants were willing to pay by 78.6¢⁷ at 50% probability and by \$2.48 at 90% probability. Likewise, a greater prize for winning produced a modest, albeit stronger, effect, increasing the amount participants were willing to pay by \$2.52 for a \$100 prize, and by \$7.95 for a \$300 prize. Together, probability and prize value produced a strong synergistic effect. Participants primed with a transformational leader were willing to pay \$36.26 more for a lottery ticket with both a 90% chance of winning and a prize of \$300, compared to a lottery ticket with a 10% chance of winning and a prize of \$10. Each of these

⁷ This value is calculated by multiplying the intercept for this factor by the factor loading at this level. In this case, \$2.48 is multiplied by .365 to determine the increase in payment at 50% probability, compared to 10% probability.

factors were significantly greater than zero, indicating that participants were willing to pay more for lottery tickets with higher prize values and higher probabilities of winning.

In comparison, being primed with a transactional leader increased the amount participants were willing to pay, compared to those participants primed with a transformational leader. While the first-order effects of probability of winning and prize value were not significant, the transactional leader prime influenced the joint effect of probability and prize value. Respondents were willing to pay \$70.57 more for a lottery ticket with both a 90% chance of winning and a prize of \$300 when primed by a transactional leader, compared to a lottery ticket with a 10% chance of winning and a prize of \$10. The \$70.57 increase is significantly greater than the comparable increase for the transformational prime condition ($p < .05$), a result indicative of a greater degree of rational integration of the prize and probability factors (i.e., a greater degree of instrumental rationality) for those primed with a transactional leader compared to those primed by a transformational leader. This difference is evident in Figure 2, which presents the average value participants were willing to pay at each level of probability and prize for the two prime conditions. The level of instrumental rationality is indicated by the slope of the lines describing the relationship between prize value and the amount participants were willing to pay at each level of probability of winning. The stronger the increase in slope as probability of winning rises, the more participants appear to be engaged in a rational integration of the probability and prize value factors. As can be seen in Figure 2, the steepness of the slopes for the transactional leader prime (Figure 2a) rose faster and finished higher than the slopes for the transformational leader prime (Figure 2b).

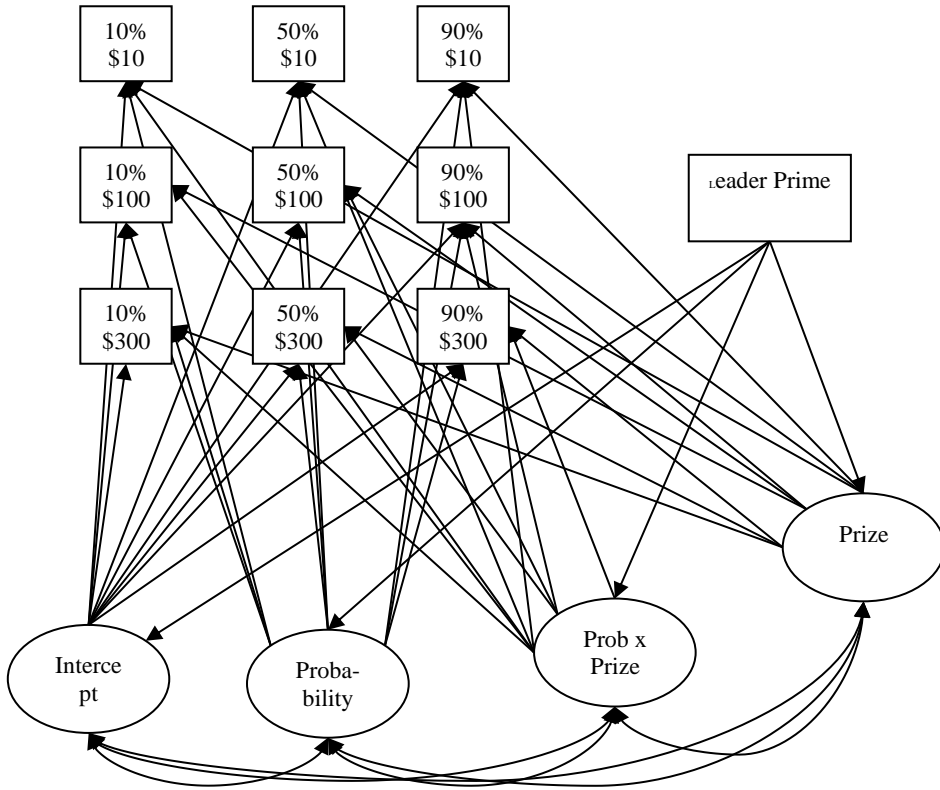


Figure 1. Latent Curve Model characterizing the effect of leader prime on the joint effect of changing probability and prize value on participant willingness to pay for lottery tickets.

Note: Leader prime was dummy coded in this analysis, with transformational leadership coded 0. Leader prime therefore characterizes the effect of transactional leadership on the four latent lottery factors compared to transformational leadership.

Table 1

Study 1: Factor Loadings for the Lottery Task

Intercept	\$10 Prize	\$100 Prize	\$300 Prize
10% Probability	1	1	1
50% Probability	1	1	1
90% Probability	1	1	1

Prize	\$10 Prize	\$100 Prize	\$300 Prize
	0	.317	1
	0	.317	1
	0	.317	1

Probability

10% Probability	0	0	0
50% Probability	.365	.365	.365
90% Probability	1	1	1

Probability
x Prize

	0	0	0
	0	.159	.516
	0	.483	1

Table 2

Study 1: Latent Factors of the Latent Trajectory Model as a Function of Leader Prime

Prime	Factor			
	Intercept	Probability	Prize	Probability x Prize
Transactional	.890	3.599	9.004	70.521*
Transformational ¹	.818**	2.480**	7.952**	36.264**

* $p < .05$; ** $p < .01$

¹ The transformational prime group was dummy coded 0; all factors for this condition were significantly different from zero. Significance test for the transactional prime group represents a difference from the transformational prime group. Numbers for transactional prime represent the sum of the intercepts of the latent factors and the prime condition path loadings.

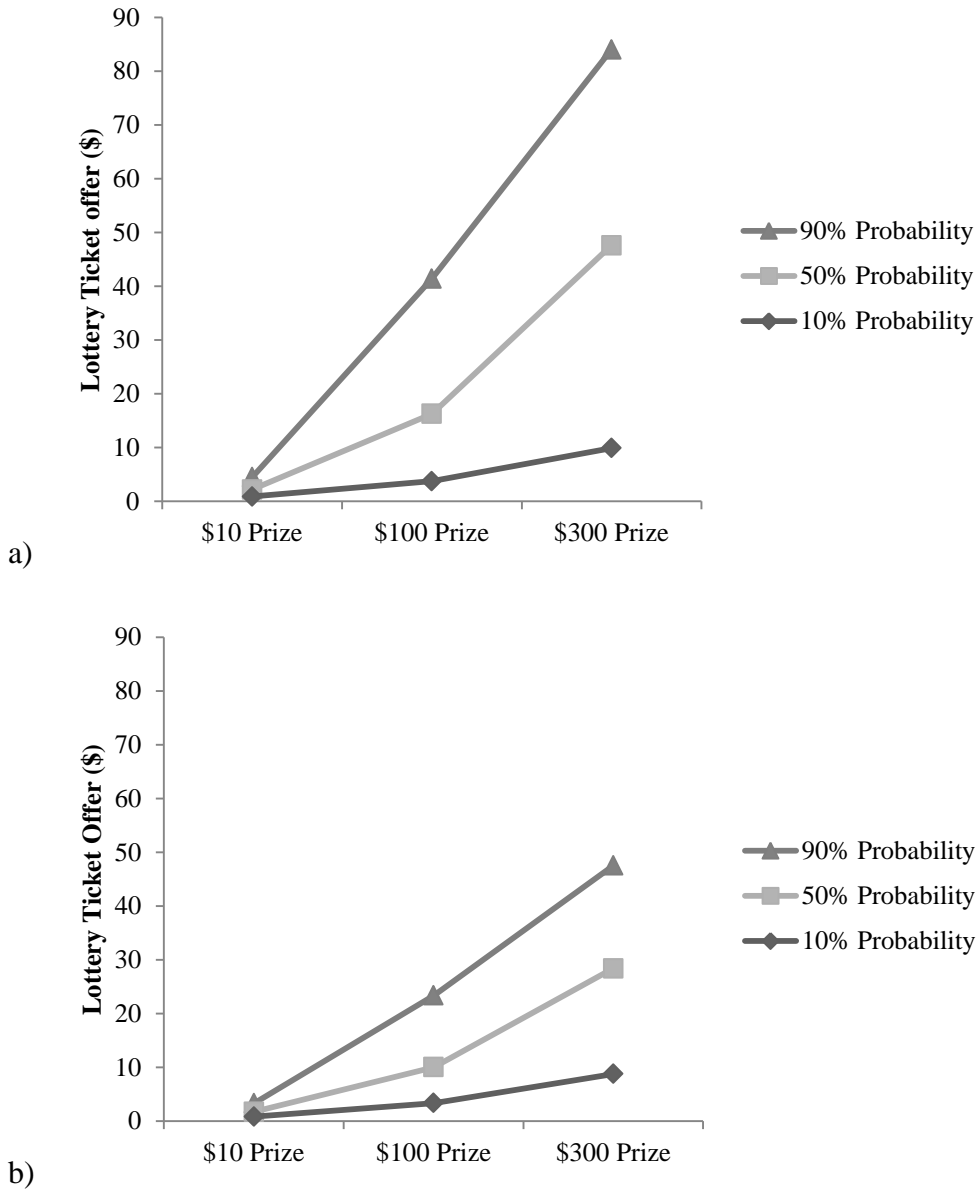


Figure 2. Amount paid for lottery tickets by probability of winning and prize value by participants in the (a) transactional prime and (b) transformational prime conditions.

Discussion

Participants in the transformational leader prime condition, relative to the transactional leader prime condition, were not as sensitive to a joint increase in the probability of winning and value of the prize. In contrast, participants in the transactional leader prime condition appeared to be using a more rational (economic) decision making process, whereby the perceived value of the lottery ticket increased as the prize and probability of winning increased, with the impact of an increase in the prize value and probability of winning being significantly more pronounced than for participants primed with the transformational leader. These findings support Hypothesis 1, and suggest that individuals exposed to a transformational leader were less likely to employ a deliberative and calculating decision making process consistent with high self-interest (Meglino & Korsgaard, 2004). Furthermore, because the leader with which the participants were primed appeared outside of their conscious awareness, these results suggest a mechanism through which leaders can have an impact on followers without the need for explicit influence behaviours.

Although Study 1 demonstrated the potential for implicit influence of leaders, it did so by priming participants with leader descriptions studied in the same experimental session. It is not clear, based on the findings of this study, whether such a leader description could have an effect on participant decision making after a number of days. Thus, Study 2 sought to replicate and extend the findings of Study 1 by introducing a longer delay between the leader impression formation task and the priming task. Additionally, Study 1 ignored the pre-existing or chronic goals, ideals, and values of participants. Research suggests that such pre-existing values may influence the effectiveness of the prime, with primed goals that are consistent with an individual's own values and ideals being more effective (Lord & Brown, 2001). Study 2 investigated this possibility by taking into account participants' pre-existing values.

Study 2: Values and Multi-session Nonconscious Priming

Study 2 was designed to replicate and extend the effects of the leader prime in Study 1. In order to test the robustness of the first study, the delay between the impression formation task and the priming task was increased from ten minutes to three days. If a leader can nonconsciously impact participants' behaviour days after being introduced (e.g., impression formation task), rather than minutes later, then it becomes more likely that their behaviour is being impacted by the priming manipulation and not the recent exposure to the impression formation task.

More importantly, Study 2 explored the impact of individual differences in the importance of particular values as a potential moderator for the effectiveness of the transformational prime on participant behaviour. According to Schwartz, values are conceptions of the desirable (i.e., ideals) that guide the way people select actions, evaluate people and events, and explain their actions and evaluations (S. H. Schwartz, 1999). For example, if you think honesty is an important value, then you will probably be reluctant to lie, and be upset when you are lied to. Essentially, values operate as high-order goals or ideals for appropriate behaviour.

Although people may differ in terms of their value priorities, the underlying structure of the human value system is universal (e.g., S. H. Schwartz, 1996; S. H. Schwartz & Boehnke, 2004). Schwartz has identified ten universal value types: (a) power values work to encourage social status and prestige and control or dominance over people and resources; (b) achievement values encourage personal success through demonstrating competence according to social standards; (c) hedonism values promote pleasure and sensuous gratification for oneself; (d) stimulation values encourage excitement, novelty, and challenge in life; (e) self-direction values promote work to support independent thought and action-choosing, creating, and exploring; (f)

universalism values encourage understanding, appreciation, tolerance, and protection for the welfare of all people and for nature; (g) benevolence values encourage preservation and enhancement of the welfare of people with whom one is in frequent personal contact; (h) tradition values promote respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide; (i) conformity values deal with the restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms; and (j) security values promote safety, harmony and stability of society, of relationships, and of self.

These values form a circumplex continuum, with related values next to one another and incompatible values opposite. Schwartz further identifies two axes along which people differ in terms of the priorities of the ten value types. Values related to openness, which includes the stimulation and self-direction value types tend to be negatively related to activation of conservation values, which include the security, conformity and tradition value types. Values related to self-transcendence, which include the universalism and benevolence value types, tend to be negatively related to activation of the self-enhancement value types of hedonism, achievement, and power. This activation relationship has been demonstrated empirically by Pakizeh, Gebauer and Maio (2007), who asked respondents to report the importance of particular values in their own lives. In this study, values were presented in pairs and response times for the second value in a pair were significantly faster if the motivation implied by the second value of a pair was consistent with the motivation implied by the first value.

Research has shown that values may also be temporarily primed by the external context, as can any other knowledge structure (Maio, 2010; Pakizeh, Gebauer, & Maio, 2007). For example, Verplanken and Holland (2002) found that priming pro-environmental values enhanced

attention to and the weight of information related to those values, which resulted in environmentally friendly consumer choices. Interestingly, the prime was most effective for those participants who reported pro-environmental values as being central to their identity (i.e., they considered these values of high personal importance). In the absence of the prime, even those participants who reported placing high importance on pro-environmental values did not make more environmentally friendly consumer choices, suggesting that these values, though strongly held by the participants, were not active at the time they made their consumer choices.

From a leadership perspective, the idea that the characteristics of the follower can moderate the effectiveness of a leader's influence has been suggested by several scholars. For example, Shamir (1990) suggests that pre-existing value orientations can moderate the influence of leaders such that those who assign goals and encourage behaviours that are in accordance with follower personal values will be most effective. For example, individual differences in collectivistic values moderate the impact of transformational leadership on performance (Jung & Avolio, 1998), and individual differences in conservation values moderate the impact of transformational leadership on creativity (Shin & Zhou, 2003). More recently, Lord and Brown (2001; 2004) have suggested that pre-existing values may moderate the effectiveness of a leader's influence, such that priming goals that are consistent with an individual's own values and ideals are more effective. As was the case for pro-environmental values and environmentally friendly consumer choices in the study by Verplanken and Holland (2002), a leader need only remind participants of their values to enhance the degree to which those values (and not others) are considered when choosing among actions. Thus, we should expect individual differences in the level of endorsement of self-transcendent values to be an important moderator of the impact of transformational leadership on self-interest; individuals who have a more communal

orientation should be more sensitive to the transformational prime. Research has also demonstrated that other-orientation is associated with reduced instrumental rationality (M. A. Korsgaard, Meglino, & Lester, 1996), thus I expect communal value orientation should also produce a first-order effect on instrumental rationality.

Hypothesis 1: Communal value orientation and the transformational leader prime will interact, such that highly communal participants primed with a transformational leader will show significantly weaker effect of probability of winning and prize value on lottery ticket offers, compared to low communal participants primed with a transformational leader and compared to participants primed with a transactional leader for both high and low communal value orientations.

Method

Participants. Participants consisted of 104 undergraduate students (25 males, 79 females) enrolled in an introductory psychology course at the University of Waterloo. Participants were pre-selected based on their responses to the communal dimensions of Schwartz's value survey (52 high, 52 low) which was completed during a mass-testing session approximately 3-6 weeks prior to the current study. In exchange for their participation, participants received one extra percentage point towards their introductory psychology class grade.

Procedure. Participants completed an initial mass-testing survey during the first two weeks of the fall semester. Embedded within the mass-testing booklet was a shortened version of the Schwartz values survey. Due to the low power expected from the combination of the unconscious prime and multiple day delay between the impression formation task and the priming task, an a priori extreme groups approach was used to enhance the power of the study

(c.f. Preacher, Rucker, MacCallum, & Nicewander, 2005). Thus, participants for the current study were randomly selected from those individuals who scored in the top and bottom 25% on the communal dimensions of the values survey. Participants were recruited to participate in a two-session study that was designed, ostensibly, to pilot test materials for future investigations. During Session 1, participants completed an impression formation task. Here, participants were provided with descriptions of two different managers with accompanying pictures. Each description included background information and a detailed description of each manager's leadership style. Using behaviours from previously established instruments (e.g., MLQ), one of the managers was described in transformational terms while the second manager was described in transactional terms (see Appendix C).

Participants were given three minutes to read each description (i.e., 6 minutes in total) and were then asked to complete a series of evaluations regarding each of the targets (see below). The purpose of the evaluation task was to ensure that participants fully memorized each of the manager's descriptions and their corresponding leadership style, and associated the description and style with the picture that was provided. To ensure that participants associated each leader with his picture, images of the leaders were used to indicate the subject of each evaluation, and thus appeared repeatedly throughout the evaluation task. Following the evaluation task, participants were thanked and scheduled for a second session.

Three days following the first session, participants returned to the lab. Upon their arrival for Session 2, participants completed the computer priming task. Immediately following the computer priming task participants completed the lottery task. Finally, participants were thanked for their participation and fully debriefed.

Stimuli and Measures

Condensed Schwartz Values Survey. In order to accommodate time and space restrictions the original 56-item Schwartz Values Survey was shortened to create a 36-item values survey (See Appendix G). Participants were asked to report their endorsement of each value on a nine-point scale which ranged from -1 (completely opposed to my values) to 7 (of supreme importance). Scores for each word in a particular dimension were added together to create a score representing the participant's endorsement of values of that type. The mean of the universalism and benevolence dimensions of the condensed Schwartz values measure was used to represent the extent to which participants endorsed self-transcendent values. Because the distribution of scores was truncated to include only high and low scores for self-transcendent values, alphas could not be estimated. According to the literature, alpha reliabilities of the 10 values average .68, ranging from .61 for tradition to .75 for universalism (S. H. Schwartz, 2005). The mean self-transcendent values for the high communal group was 6.56 ($sd = .26$), while the mean for the low communal group was 4.40 ($sd = .67$). These groups differed significantly on this dimension ($p < .01$).

Leader Descriptions. Two new leader descriptions were created for Study 2 based on previously published leadership descriptions (i.e., Paul, Costley, Howell, Dorfman, & Trafimow, 2001) and currently available conceptual definitions of transformational and transactional leadership (e.g., Avolio, 1999).⁸ In addition to providing each participant with a description of a transformational and transactional leader, participants were also provided with an accompanying

⁸ A pilot test was conducted in which 63 participants were asked to report the values held by each of the two leaders based on the descriptions used in this study. Values were measured using both the Schwartz Values Survey and the Portrait Values Questionnaire. Participants rated the transformational leader significantly higher on self-transcendent values ($M_{SVS}=.81$, $sd_{SVS}=1.11$, $M_{PVQ}=.70$, $sd_{PVQ}=.72$) compared to the transactional leader ($M_{SVS}=-.51$, $sd_{SVS}=1.17$, $M_{PVQ}=-.15$, $sd_{PVQ}=.79$; $t_{SVS(62)}=5.75$, $p<.01$, $t_{PVQ(62)}=5.76$, $p<.01$), and rated the transformational leader significantly lower on self-enhancement values ($M_{SVS}=-.14$, $sd_{SVS}=.91$, $M_{PVQ}=-.29$, $sd_{PVQ}=.83$) compared to the transactional leader ($M_{SVS}=.91$, $sd_{SVS}=1.00$, $M_{PVQ}=.744$, $sd_{PVQ}=.94$; $t_{SVS(62)}=6.11$, $p<.01$, $t_{PVQ(62)}=6.15$, $p<.01$). Thus the transformational leader description was more highly associated with (and so more likely to prime) self-transcendence while the transactional leader description was more highly associated with self-enhancement.

photograph of a male.⁹ To ensure that the picture was not confounded with the description, the particular picture that was presented with each leader description was counterbalanced across participants. Additionally, the order in which participants read about each leadership style was also counterbalanced across participants. The order in which participants read about each style had no effect, and so will not be discussed further. The leader descriptions are presented in Appendix C.

Leader Learning/Impression Formation Tasks. Three tasks were used during Session 1 to encourage participants to think critically about each leader and increase the salience of the differences between the leadership styles. The second was based very closely on the leader impression formation task from Study 1, while the first and third were developed for Study 2. The first, a behavioral decision activity, required participants to decide which of the two leaders was most likely to engage in each of a list of 24 behaviors. The second involved two writing tasks, one per leader, for which participants were asked to describe three behaviors they remembered the leader engaging in and then write down their thoughts and impressions of that leader. In the last impression formation task, participants responded to two 20-item questionnaires, one for each leader. The 20-item questionnaire asked participants to rate the leader on transformational, transactional, and laissez-faire leadership styles based on items from the Multifactor Leadership Questionnaire (manipulation check; Avolio, Bass, Walumbwa, & Zhu, 2004), and rate each leader's general self-transcendent and self-enhancing value orientations based on the Schwartz values measure (Schwartz, 1994). Only the pictures initially

⁹ Research suggests that the leader concept is more strongly and consistently activated for male leaders than for female leaders (Scott & Brown, 2006). In particular, while communal and agentic males and communal females may unconsciously activate the leader prototype and thus be regarded as prototypically leader-like, agentic females appear to be more weakly associated with the concept of leadership. In order to enhance the consistency of the strength of the leader prime for both the transformational and transactional conditions, only pictures of males were used to prime leadership.

presented with the leader descriptions identified the two leaders in each of these tasks. The impression formation tasks are presented in Appendix D.

Computer priming task. The computer priming task was identical to the one used in Study 1.

Lottery task. This task was identical to the task used in Study 1.

Results

Manipulation check. I examined individuals' ratings on the MLQ from Session 1 to determine whether the leader descriptions were successful in manipulating participants' perceptions of transformational and transactional leadership. Overall, results indicated that the two leader descriptions were seen as significantly different in terms of both transformational and transactional leadership by participants. More specifically, the transformational leader description was rated significantly more transformational than the transactional leader description ($M_{transformational} = 4.20, sd = .56, M_{transactional} = 2.98, sd = .75; t_{(103)} = 11.98, p < .001$). Additionally, the transactional leader description was rated significantly more transactional than the transformational leader description ($M_{transactional} = 4.42, sd = .59, M_{transformational} = 2.61, sd = .63; t_{(103)} = 18.329, p < .001$).

Latent Curve Model of Lottery Task Data. As for Study 1, the trajectory of lottery task results was modeled using a four-factor latent curve model. As before, responses to lottery task items are used as indicators of a latent trajectory model that characterizes the relationship between probability of winning and prize value. One latent factor represents the intercept component of the trajectory model. Participant responses to each level of probability become indicators of a "shape" factor characterizing the effect of probability, with the loadings for the middle level (50%) determined empirically by the data. Likewise, participant responses to each

level of prize become indicators of a “shape” factor characterizing the effect of prize value with the loadings for the middle level (\$100) determined empirically by the data. Additionally, a fourth latent factor characterizing the joint relationship of probability and prize is estimated (see Figure 3).

This model fit the data well, producing a chi-square of 74.644 ($df = 40$), $p = .001$, a CFI of .966, and a RMSEA of .092, and provided a significant improvement in fit over a model where the relationship between prize and probability, as well as their interaction, was assumed to be linear¹⁰.

Factor loadings for lottery task responses on the four latent factors appear in Table 3. Consistent with a latent growth curve modelling analysis procedure (Bollen & Curran, 2006) , all factor loadings for the intercept were set to 1 (Table 3-Intercept). Factor loadings for the prize factor across all levels of probability were set to 0 and 1 for the lowest (\$10) and highest (\$300) prize levels, respectively. The factor loading for the middle prize level (\$100), determined by the data but constrained to be equal across probabilities, was .352 (see Table 3-Prize). This indicates that the effect of the middle prize level was roughly one-third (35.2%) as influential as the highest prize level; in a linear model, one would expect the middle level to be 50% as influential.

Factor loadings for the probability factor across all levels of prize were set to 0 and 1 for the lowest (10%) and highest (90%) probability levels, respectively. The factor loading for the middle probability level (50%), determined by the data but constrained to be equal across prize

¹⁰ In order to test the linear model, factor loadings for probability were set to 0, .5, and 1 for 10%, 50% and 90% probabilities, respectively. Likewise, factor loadings for prize value were set to 0, .5, and 1 for \$10, \$100, and \$300 prize values, respectively. The probability x prize interaction was modelled using zeros for all 10% probabilities and \$10 prize value factor loadings, .25 for the 50%/\$100 factor loading, .5 for the 50%/\$300 and 90%/\$100 factor loadings, and 1 for the 90%/\$300 factor loading; this represents a multiplication of corresponding combinations of first-order factor loadings for proportion and prize value. Fit for this model indicated poorer fit than a freed-loading model, producing a chi-square of 179.515 ($df = 45$), $p < .001$, CFI of .870, and RMSEA of .170. A test of the difference between these nested models indicated a significant improvement of fit with the freed-loading model (chi-square difference = 104.871 ($df = 5$), $p < .001$).

levels, was .530 (see Table 3-Probability). This result indicates that the effect of the middle probability level was roughly one half (53.0%) as influential as the highest probability level, or roughly linear.

Factor loadings for the prize by probability interaction were set to 0 for the lowest levels of prize and probability (i.e., all factors for which prize = \$10 and/or probability = 10%) and 1 for the highest level of probability and prize (i.e., for the 90% probability, \$300 prize indicator). The factor loadings for the other three indicators were determined by the data and not constrained to be equal (see Table 3-Prize x Probability). Results suggest a synergistic interaction between probability and prize such that participants are willing to pay more for lottery tickets when both the probability of winning and the prize for winning are large, over and above the first-order effect of prize and probability alone.

The effect of probability and prize value, as well as their joint effect, for the reference group (i.e., group dummy coded 0) is captured by the value of the intercept for each of the corresponding latent factors presented along the bottom of Figure 3. In this case, the low communal value orientation / transformational leader prime condition serves as the reference group, coded zero, and the effect of each of the other three combinations of value orientation and leader prime, coded one, are reflected in the values of their respective paths. The effect of each of these combinations of conditions is characterized by the sum of the intercept value and the path value for each latent factor. The intercept values, representing the effect of the transformational prime on low communal participants, as well as the sum of the intercept values and the path values, representing the effect of the other conditions, appear in Table 4.

Low communal participants primed with a transformational leader were willing to pay an average of 67.9¢ for a lottery ticket with a 10% chance of winning \$10. A higher probability of

winning produced a modest effect, increasing the amount participants were willing to pay by \$1.35¹¹ at 50% probability and by \$2.55 at 90% probability. Likewise, a greater prize for winning produced a modest, albeit stronger, effect, increasing the amount participants in this condition were willing to pay by \$3.58 for a \$100 prize, and by \$10.18 for a \$300 prize. Together, probability and prize value produced a strong synergistic effect. Low communal participants primed with a transformational leader were willing to pay \$56.84 more for a lottery ticket with both a 90% chance of winning and a prize of \$300.

In comparison, highly communal participants primed with a transformational leader demonstrated significantly less sensitivity to the probability and prize factors. While the non-significant result for the intercept factor indicates that participants in this condition did not differ significantly from transformational prime/low communal participants in terms of what they were initially willing to pay for a lottery ticket, highly communal participants demonstrated significantly reduced effects for probability of winning and prize value. A higher probability of winning increased the amount transformational prime/highly communal participants were willing to pay by 56.3¢ at 50% probability and by \$1.06 at 90% probability; significantly less than transformational prime/low communal participants ($p < .01$). A greater prize for winning increased the amount these same participants were willing to pay by \$3.24 for a \$100 prize, and by \$6.12 for a \$300 prize; again, significantly less than transformational prime/low communal participants ($p < .01$). Together, probability and prize value produced a synergistic effect. Highly communal participants primed with a transformational leader were willing to pay \$24.93 more for a lottery ticket with both a 90% chance of winning and a prize \$300. This value was less than

¹¹ Middle level values (i.e., 50% probability or \$100 prize) are calculated by multiplying the intercept for this factor by the factor loading at this level. In this case, \$2.55 (the value of the intercept for the probability factor) is multiplied by .530 (the value of the factor loading at 50% probability) to determine the increase in payment at 50% probability, compared to 10% probability (\$1.35 in the present example).

half the amount low communal participants primed with a transformational leader were willing to pay and represented a significant difference ($p < .01$), a result indicative of a reduced degree of rational integration of the prize and probability factors (i.e., reduced instrumental rationality) for highly communal participants primed with a transformational leader compared to low communal participants primed by a transformational leader.. Those participants primed with a transactional leader, regardless of their level of communal value orientation, did not significantly differ from low communal participants primed with a transformational leader. This relationship can be seen clearly in Figure 4, which presents the average value participants were willing to pay at each level of probability and prize for the four combinations of leader prime and communal value orientation. The level of instrumental rationality is indicated by the slope of the lines describing the relationship between prize value and the amount participants were willing to pay at each level of probability of winning. The stronger the increase in slope as probability of winning rises, the more participants appear to be engaged in a rational integration of the probability and prize value factors. As can be seen in Figure 4, the steepness of the slopes for participants in the transactional leader prime conditions (Figure 4c and 4d) and the low communal participants exposed to the transformational leader prime (Figure 4a) rose faster and finished higher than the slopes for the highly communal participants exposed to the transformational leader prime (Figure 4b). Thus, hypothesis 1, that communal value orientation and the transformational leader prime will interact, such that highly communal participants primed with a transformational leader will show significantly weaker effect of probability of winning and prize value on lottery ticket offers than low communal participants primed with a transformational leader and compared to both high and low communal participants primed with a transactional leader, was supported.

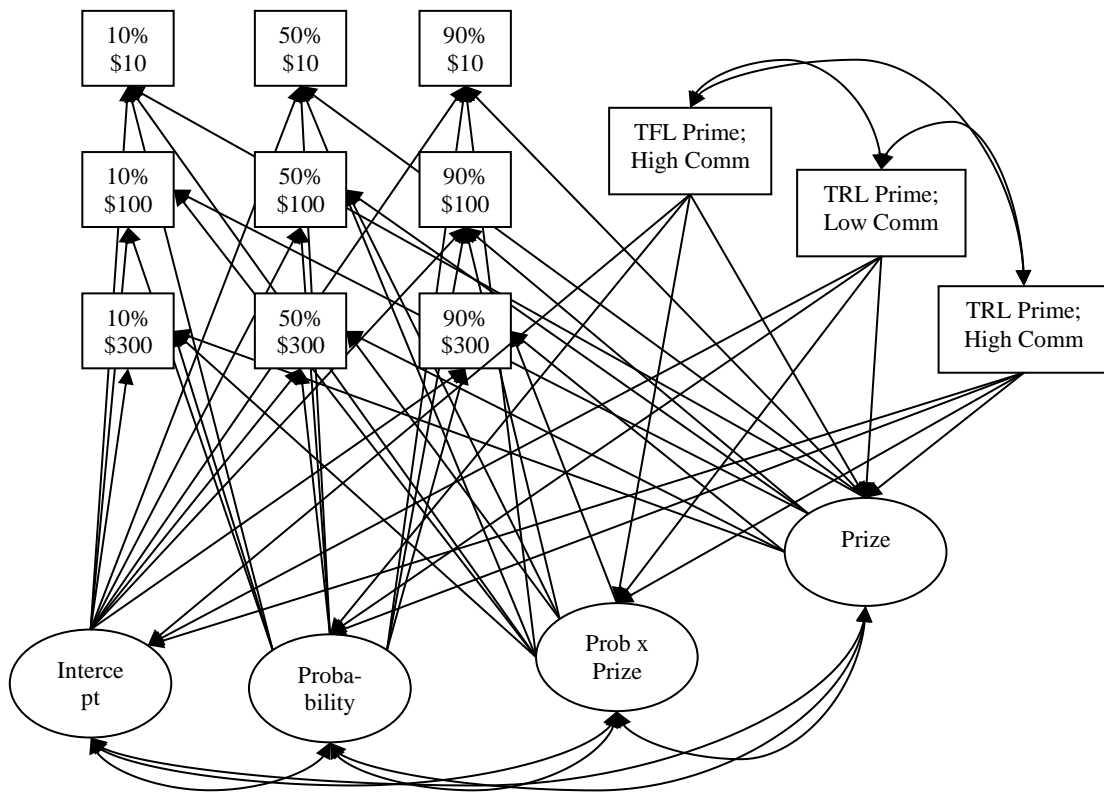


Figure 3. Latent Curve Model characterizing the effect of leader prime and communalism on the joint effect of changing probability and prize value on participant willingness to pay for lottery tickets.

Note: Leader prime and communal value orientation were dummy coded in this analysis, with transformational leadership and a high communal value orientation both coded 0. The leader prime factor therefore characterizes the effect of transactional leadership on the four latent lottery factors compared to transformational leadership. Likewise, the communal value orientation factor characterizes the effect of low communal value orientation on the four latent lottery factors compared to high communal value orientation.

Table 3

Study 2: Factor Loadings for the Lottery Task

Intercept	\$10 Prize	\$100 Prize	\$300 Prize	Prize	\$10 Prize	\$100 Prize	\$300 Prize
10% Probability	1	1	1	0	.352	1	
50% Probability	1	1	1	0	.352	1	
90% Probability	1	1	1	0	.352	1	
Probability				Probability x Prize			
10% Probability	0	0	0	0	0	0	
50% Probability	.530	.530	.530	0	.165	.456	
90% Probability	1	1	1	0	.372	1	

Table 4

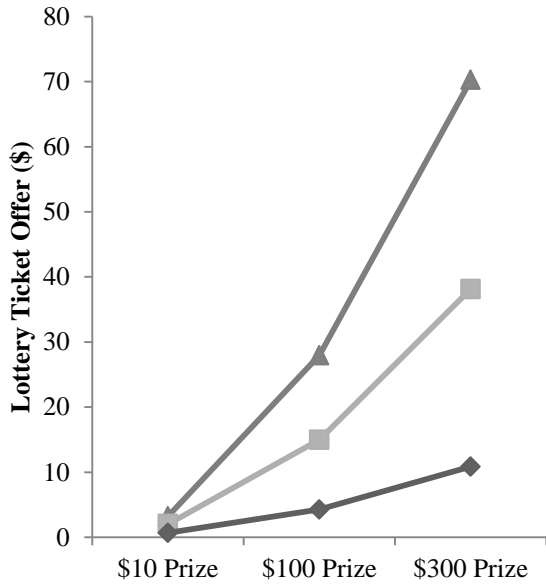
Study 2: Factors of the Latent Trajectory Model as a Function of Leader Prime and Level of Communalism

	Intercept	Probability	Prize	Probability x Prize
Transformational Prime; Low Communalism ¹	.679**	2.554**	10.18**	56.842**
Transformational Prime; High Communalism	.920	1.063**	6.121**	24.926**
Transactional Prime; Low Communalism	.759	2.013	6.292 [†]	51.88
Transactional Prime; High Communalism	.790	2.457	8.649	45.383

[†] $p < .10$; * $p < .05$; ** $p < .01$; ¹ The transformational prime/low communalism group was dummy coded 0; all factors for this combination of conditions were significant, representing a difference from zero. Significance tests for other groups represent a difference from the transformational prime/low communalism group.

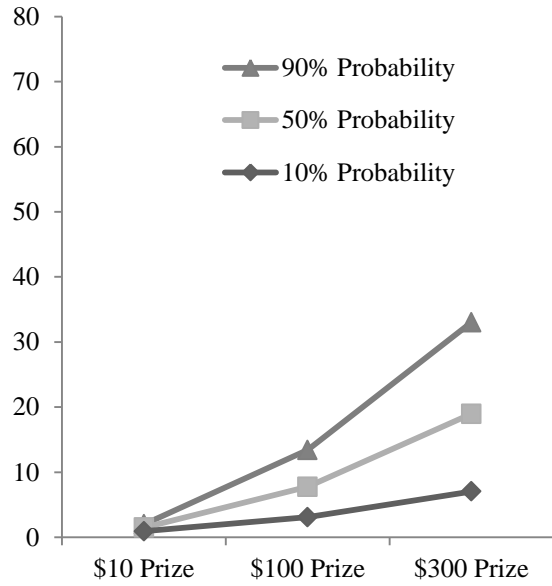
a) Transformational Leader; Low Communal

Values



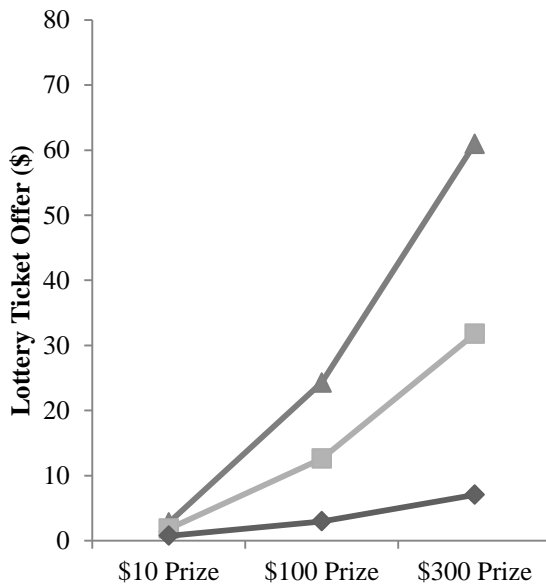
b) Transformational Leader; High Communal

Values



c) Transactional Leader; Low Communal

Values



d) Transactional Leader; High Communal

Values

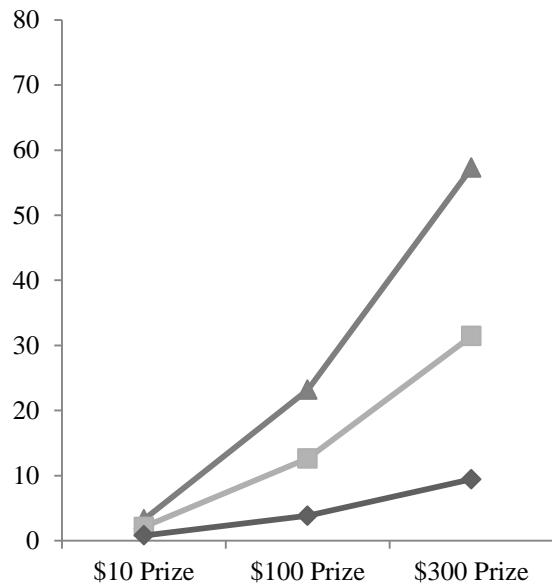


Figure 4. Amount paid for lottery tickets by probability of winning and prize value for participants by leader prime and communal value orientation.

Discussion

The results of Study 2 demonstrated that being primed with the image of a leader encountered days earlier affects self-interest in a similar manner to what was found in Study 1. The multi-day delay between the explicit impression formation task and the unconscious priming task suggests that the effect of a leader prime on the behaviour of followers is fairly robust and does not require a proximal explicit exposure to the leader in order to have an effect on participant behaviour. Moreover, Study 2 demonstrated that participants' pre-existing values moderated the effect of the leader prime. Highly communal participants who were primed with the picture of the leader associated with the transformational behaviours were less sensitive to the value of the prize and probability of winning, when compared to low communal participants and participants primed with the transactional leader. Low communal participants or those participants in the transactional leader prime condition appeared to be using a more rational (economic) decision making process, whereby the perceived value of the lottery ticket increases as the prize and probability of winning increases. Like Study 1, these findings suggest that individuals exposed to a transformational leader were less likely to employ a deliberative and calculating decision making process consistent with high instrumental rationality. Interestingly, the leader prime was only effective when the participants held a highly communal value orientation.

Although Study 2 demonstrated the potential for implicit influence of a leader days after forming an impression of that leader, as well as the moderating role of individual values, the absence of a control condition makes it unclear whether highly communal participants became less self-interested in response to the transformational leader prime, or became more self-interested in response to the transactional leader prime. Additionally, both Study 1 and Study 2

relied on the same dependent indicator of self-interest (i.e., the lottery task). Study 3 sought to extend Study 2 by adding a second dependent measure of self-interest, a tragedy of the commons task, as well as including a control or “no prime” condition in order to explore the nature of the prime effect.

Study 3: Two-Session Study with Alternate Dependent Variable

Study 3 was designed to replicate the effect of the nonconscious leader prime on participant self-interest, as well as extend Studies 1 and 2 in two key respects. First, Study 3 included a control condition, which provided the opportunity to explore the direction of the difference in self-interested behaviour among followers of transformational and transactional leaders. Specifically, I examined whether the transformational leadership prime resulted in decreased self-interest, as the extant literature would predict, or whether the effect may instead be due to the transactional leadership prime promoting self-interest. There is reason to expect, as the literature argues, that the effect is produced by the transformational leader causing the shift away from self-interest. As discussed above, there is a norm of self-interest that dictates that individuals should make decisions and act in ways that promote their own self-interest (Holmes, Miller & Lerner, 2002; Miller, 1999). This norm is the basis for the prevailing view of human behaviour in economics, and suggests that people will do what is best for them even if it is detrimental to the common good. Based on this research, I predicted that the control condition would represent normative self-interested behaviour. It is not clear based on the existing research whether transactional leaders will promote self-interest above the level expected in the control condition, or whether there will be no effect relative to the control condition. For reasons of parsimony, I hypothesized that there would be no difference between the transactional prime condition and the control condition.

The second way in which Study 3 extends the previous two studies is in adding an additional dependent variable, the tragedy of the commons task, to assess self-interest. This task differs from the lottery task in that it presents participants with a social dilemma (i.e., it involves hypothetical others) whereby participants choose how many resources to take from a common pool. Whereas the lottery task is independent of others (i.e., the amount that participants are willing to pay for a lottery ticket in no way impacts anyone else), the tragedy of the commons task assesses self-interest in an interdependent context. Self-interested behaviour in the tragedy of the commons task consists of equal parts self-promotion and other-deprecation. That is, in order to engage in self-enhancement on this task, participants must take something away from their hypothetical peers. This alternative approach to assessing self-interest should strengthen the priming effect by demonstrating that it generalizes to an alternative type of decision making, while at the same time exploring the effect of prosocial and proself priming in an alternative context.

Hypothesis 1a: The nonconscious transformational leader prime will decrease the number of shared resources participants intend to take for themselves, relative to the no prime control condition.

Hypothesis 1b: The nonconscious transformational leader prime will decrease the number of shared resources participants intend to take for themselves, relative to the nonconscious transactional leader prime.

Hypothesis 1c: There will be no significant difference in the number of shared resources participants intend to take for themselves in the nonconscious transactional leader prime condition compared to the no prime control condition.

Hypothesis 2a: The nonconscious transformational leader prime will reduce the effect of probability of winning and prize value on lottery ticket offers, relative to the no prime control condition.

Hypothesis 2b: The nonconscious transformational leader prime will reduce the effect of probability of winning and prize value on lottery ticket offers, relative to the nonconscious transactional leader prime.

Hypothesis 2c: The effect of probability of winning and prize value on lottery ticket offers of participants in the nonconscious transactional leader prime condition will not differ from the no prime control condition.

Hypothesis 3a: Leader prime and values will interact such that participants with a high communal value orientation will be more sensitive to the transformational leader prime, and will allocate fewer resources to themselves, compared to participants with a low communal value orientation, or participants primed with a transactional leader.

Hypothesis 3b: Leader prime and values will interact such that participants with a high communal value orientation will be more sensitive to the transformational leader prime, and will demonstrate reduced sensitivity to the effect of probability of winning and prize value on lottery ticket offers, compared to participants with a low communal value orientation, or participants primed with a transactional leader.

Method

Participants. The sample consisted of 106 undergraduate students (58 females) enrolled in an introductory psychology course at the University of Waterloo. Participants received extra credit toward their psychology class grade in exchange for their participation.

Procedure. Participants were recruited to participate in a two-session study that was presented ostensibly as pilot test materials for future investigations. During Session 1, participants first completed the Portrait Values Questionnaire and then engaged in a leader impression formation task. Here, participants were provided with a picture and short description of two different leaders. Each description included background information and detailed information about each leader's leadership style with one leader described in transformational terms while the other leader was described in transactional terms.

As in the previous two studies, participants were given three minutes to read each description (i.e., 6 minutes in total) and were then asked to complete a series of evaluations regarding each of the leaders. The purpose of the evaluation tasks was to ensure that participants fully memorized each of the manager's descriptions and their corresponding leadership style, and associated the description and style with the picture that was provided. To ensure that each style was associated with the correct picture, images of the leaders appeared repeatedly throughout the evaluation task. Following the evaluation task, participants were thanked and scheduled for a second session.

Three days following the first session, participants returned to the lab. Upon their arrival for Session 2, participants completed the computer priming task. Participants then completed the tragedy of the commons task and lottery task. Finally, participants were thanked for their participation and fully debriefed.

Stimuli and Measures

Portrait Values Questionnaire. The Portrait Values Questionnaire measures a comprehensive set of 10 basic human values through 40 short verbal portraits (See Appendix H). Each portrait describes the goals, aspirations, or ideals indicative of a person who holds a

particular value. For example, the item “It is important to him to be in charge and tell others what to do. He wants people to do what he says” describes a person who exemplifies power values. Respondents indicate to what degree they are like the person described in each portrait on a 6-point scale ranging from “very much like me” to “not like me at all.” Alpha reliabilities of the ten values averaged .68, ranging from .47 for tradition to .80 for achievement (S. H. Schwartz, 2005). This scale was used to assess participant’s communal value orientation, created by using the mean of participants’ universalism and benevolence values.

Leader Descriptions. These materials are identical to the leader descriptions used in Study 2.

Leader Learning/Impression Formation Tasks. These materials were identical to the leader learning and impression formation tasks used in Study 2.

Computer Priming Task. This task was identical to the computer priming task used in Studies 1 and 2 with two key differences. First, participants were asked to identify 25 images, as opposed to 15. Second, for two-thirds of participants, the image of one of the leaders presented in the leader descriptions appeared 15 times during this task (leader prime condition); the other 10 images were of neutral everyday objects (e.g., an umbrella). For the remaining one-third of participants, all 25 images were of neutral objects (control condition).

Lottery Task. The lottery task used in this study was identical to the lottery task used in Study 1 and Study 2.

Tragedy of the Commons Task. This task was adapted from *the social dilemma task* presented in Experiment 2 of van Dijk and De Cremer (2006). Participants were asked to imagine that they were a member of a four person group which had a collective resource of 400 ‘chips’ which they were to divide amongst themselves. Each person was to take a turn deciding

how many chips to allocate to themselves, reducing the number of available chips for subsequent group members. Instructions also stated that the order in which group members chose was decided randomly, however, in truth, participants were always asked to choose first. After all group members had made their decision, the remaining chips were to be doubled and divided evenly amongst all group members. Thus the highest number of chips achievable by the group as a whole (i.e., 800) was possible only if all chips were left in the common pool. Conversely, the highest number of chips that could be allocated to a single group member (i.e., 400) was possible only if a group member found 400 chips in the common pool on their turn and subsequently allocated all those chips to him or herself. Participants with a prosocial value orientation should leave more ‘chips’ in the common pool compared to their self-interested peers. The tragedy of the commons task is presented in Appendix F.

Results

Of the initial sample of 106 participants, two were removed because they indicated during debriefing seeing one or both of the leaders during the computer priming task. Subsequent analyses are conducted on the remaining 104 participants.

Manipulation check. I examined individuals’ ratings on the MLQ to determine whether the leader descriptions were successful in manipulating participants’ perceptions of transformational and transactional leadership. Overall, results indicated that the two leader descriptions were seen as significantly different in terms of both transformational and transactional leadership by participants. More specifically, the transformational leader was rated to be significantly more transformational than the transactional leader ($M_{transformational} = 4.03$, $sd = .70$, $M_{transactional} = 3.58$, $sd = .74$; $t_{(103)} = 4.186$, $p < .001$). Additionally, the transactional leader

was rated to be significantly more transactional than the transformational leader ($M_{transactional} = 4.17$, $sd = .67$, $M_{transformational} = 3.19$, $sd = .83$; $t_{(103)} = 7.964$, $p < .001$).

Lottery Task Results. As with Studies 1 and 2, the trajectory of lottery task results were modeled using a four-factor latent curve model. As before, responses to lottery task items are used as indicators of a latent trajectory model that characterizes the relationship between probability of winning and prize value. One latent factor represents the intercept component of the trajectory model. Participant responses to each level of probability become indicators of a “shape” factor characterizing the effect of probability, with the loadings for the middle level (50%) determined empirically by the data. Likewise, participant responses to each level of prize become indicators of a “shape” factor characterizing the effect of prize value with the loadings for the middle level (\$100) determined empirically by the data. Additionally, a fourth latent factor characterizing the joint relationship of probability and prize is estimated (see Figure 5).

This model fit the data well, producing a chi-square of 58.76 ($df = 39$), $p = .022$, a CFI of .974, and a RMSEA of .071, and provided a significant improvement in fit over a model where the relationship between prize and probability, as well as their interaction, was assumed to be linear.¹²

Factor loadings for lottery task responses on the four latent factors appears in Table 5. Consistent with a latent growth curve modelling analysis procedure (Bollen & Curran, 2006) , all factor loadings for the intercept were set to 1 (Table 5-Intercept). Factor loadings for the prize

¹² In order to test the linear model, factor loadings for probability were set to 0, .5, and 1 for 10%, 50% and 90% probabilities, respectively. Likewise, factor loadings for prize value were set to 0, .5, and 1 for \$10, \$100, and \$300 prize values, respectively. The probability x prize interaction was modelled using zeros for all 10% probabilities and \$10 prize value factor loadings, .25 for the 50%/\$100 factor loading, .5 for the 50%/\$300 and 90%/\$100 factor loadings, and 1 for the 90%/\$300 factor loading; this represents a multiplication of corresponding combinations of first-order factor loadings for proportion and prize value. Fit for this model indicated poorer fit than a freed-loading model, producing a chi-square of 190.341 ($df = 44$), $p < .001$, CFI of .808, and RMSEA of .181. A test of the difference between these nested models indicated a significant improvement of fit through the freed-loading model (chi-square difference = 131.581 ($df = 5$), $p < .001$).

factor across all levels of probability were set to 0 and 1 for the lowest (\$10) and highest (\$300) prize levels, respectively. The factor loading for the middle prize level (\$100), determined by the data but constrained to be equal across probabilities, was .127 (see Table 5-Prize). This indicates that the effect of the middle prize level was roughly one-eighth (12.7%) as influential as the highest prize level; in a linear model, one would expect the middle level to be 50% as influential.

Factor loadings for the probability factor across all levels of prize were set to 0 and 1 for the lowest (10%) and highest (90%) probability levels, respectively. The factor loading for the middle probability level (50%), determined by the data but constrained to be equal across prize levels, was .470 (see Table 5-Probability). This result indicates that the effect of the middle probability level was roughly one half (47.0%) as influential as the highest probability level, or roughly linear.

Factor loadings for the factor characterizing the prize by probability interaction were set to 0 for the lowest levels of prize and probability (i.e., all factors for which prize = \$10 and/or probability = 10%) and 1 for the highest level of probability and prize (i.e., for the 90% probability, \$300 prize indicator). The factor loadings for the other three indicators were determined by the data and not constrained to be equal (see Table 5-Prize x Probability). Results suggest a synergistic interaction between probability and prize such that participants are willing to pay more for lottery tickets when both the probability of winning and the prize for winning are large, over and above the first-order effect of prize and probability alone.

The effect of probability and prize value, as well as their joint effect, for the reference group (i.e., group dummy coded 0) is captured by the value of the intercept for each of the corresponding latent factors presented along the bottom of Figure 5. In this case, the control (no prime) condition serves as the reference group. The effect of the transactional and

transformational leader primes are reflected in the coefficients for the paths linking the leader prime factors to the latent factors in Figure 5. Likewise, the effect of communal value orientation is reflected in the coefficients for the path linking this factor to the latent lottery factors in Figure 6. The effect of each of these factors is characterized by the sum of the intercept value and the path value for each latent factor. The intercept values, representing the effect of the transformational prime on highly communal participants, as well as the sum of the intercept values and the path values, representing the effect of the other conditions, appear in Table 6.

Participants in the control (no prime) condition were willing to pay an average of 60.6¢ for a lottery ticket with a 10% chance of winning \$10. A higher probability of winning produced a modest effect, increasing the amount participants were willing to pay by \$1.36¹³ at 50% probability and by \$2.89 at 90% probability compared to a lottery ticket with a 10% chance of winning. Likewise, a greater prize for winning produced a strong effect, increasing the amount participants were willing to pay by \$2.78 for a \$100 prize, and by \$21.94 for a \$300 prize compared to a lottery ticket with a \$10 prize. Together, probability and prize value produced a strong synergistic effect. Control participants were willing to pay \$77.76 more for a lottery ticket with both a 90% chance of winning and a prize \$300 compared to a lottery ticket with a 10% chance of winning \$10.

In comparison, priming participants with a transformational leader significantly reduced the amount they were willing to pay. While the non-significant result for the intercept factor indicates that participants in this condition did not differ significantly from control participants in terms of what they were initially willing to pay for a lottery ticket, participants primed with a

¹³ This value is calculated by multiplying the intercept for this factor by the factor loading at this level. In this case, \$2.89 is multiplied by .470 to determine the increase in payment at 50% probability, compared to 10% probability.

transformational leader showed significantly reduced sensitivity to the probability of winning. An increase in the probability of winning was significantly less influential for transformationally primed participants ($p < .05$); they were willing to pay only 85¢¹⁴ at 50% probability and \$1.81 at 90% probability. There was also a significant reduction in the synergistic effect of probability and prize value. Participants primed with a transformational leader were willing to pay \$42.02 for a lottery ticket with both a 90% chance of winning and a prize \$300, a significant difference from control participants ($p < .05$). Participants in this condition offered \$35 less than control participants on average, providing support for hypothesis 2a.

As shown in Table 6, participants primed with a transactional leader did not differ significantly from control participants, thus hypothesis 2b and 2c were supported. Additionally, there was no effect of participant communal value orientation on the amount participants were willing to pay, thus hypothesis 3b was not supported. The pattern of results for the three leader prime conditions can be seen in Figure 6, which presents the average value participants were willing to pay at each level of probability and prize for each of the three prime conditions. The level of instrumental rationality is indicated by the slope of the lines describing the relationship between prize value and the amount participants were willing to pay at each level of probability of winning. The stronger the increase in slope as probability of winning rises, the more participants appear to be engaged in a rational integration of the probability and prize value factors. As can be seen in Figure 6, the steepness of the slopes for the control condition (Figure 2a) and transactional leader prime condition (Figure 2b) rose faster and finished higher than the

¹⁴ This value is calculated by multiplying the intercept for this factor by the factor loading at this level. In this case, \$2.48 is multiplied by .530 to determine the increase in payment at 50% probability, compared to 10% probability.

slopes for the transformational leader prime (Figure 2c), illustrating the reduced instrumental rationality for those participants primed with a transformational leader.

Tragedy of the Commons Task Results. To test the effect of nonconscious leader prime on participant willingness to remove resources from a communal source, I regressed the number of ‘chips’ participants intended to allocate to themselves (i.e., proself behavior) in the tragedy of the commons task on communal value orientations, leader prime condition (dummy coded with the no prime condition serving as the reference), and their interactions. A significant main effect of communal values ($t_{(100)} = 2.69, p < .01$) emerged such that those participants high in communal values took fewer resources from the common pool. In addition, a significant effect of the transactional leader prime ($t_{(100)} = 1.99, p < .05$), but not the transformational leader prime ($t_{(100)} = .04, p > .05$), emerged. These results suggest that the nonconscious transformational leader prime decreased the number of shared resources participants intended to take for themselves, relative to the nonconscious transactional leader prime. Rerunning the analysis with the transactional leader prime serving as the reference showed a significant difference between the transactional and transformational prime conditions ($t_{(100)} = 2.01, p < .05$), providing support for hypothesis 1b. Interestingly, the transactional prime increased self-interested behavior relative to the control condition as opposed to the transformational prime decreasing self-interest (see Figure 7), thus hypotheses 1a and 1c were not supported. Counter to hypothesis 3a, no effect was found for the interaction between value orientation and leader prime condition. These variables were dropped from the final model.

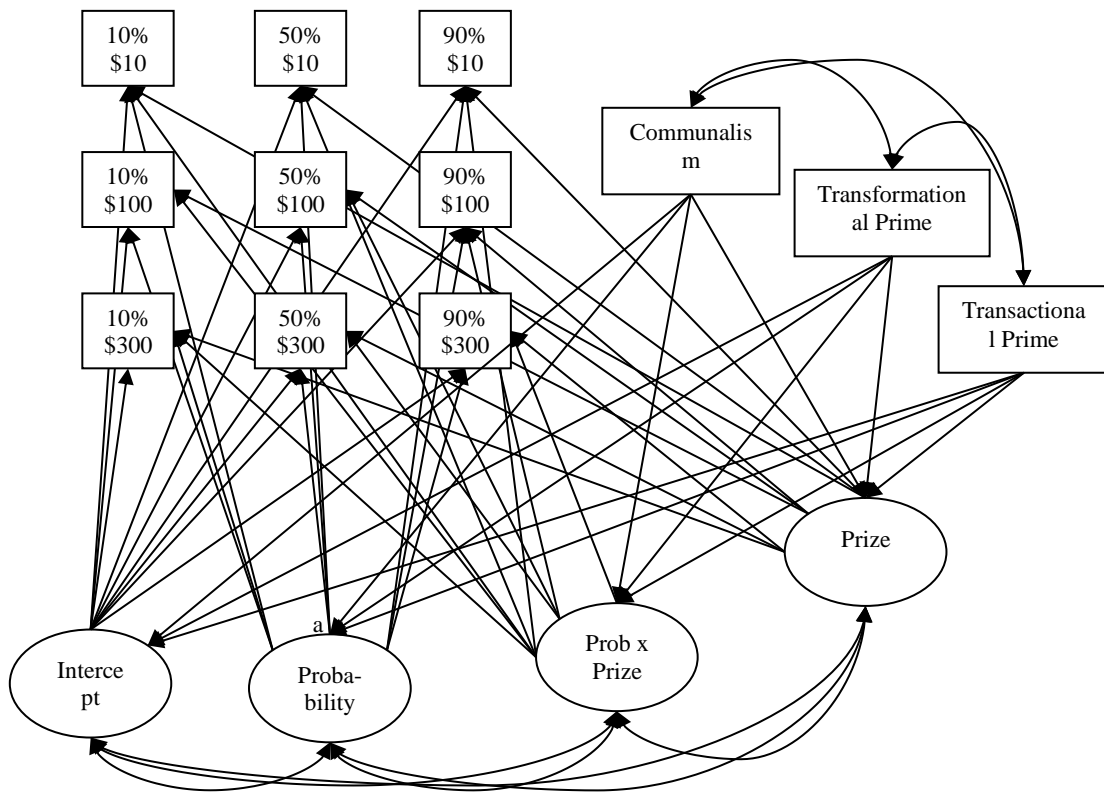


Figure 5. Latent Curve Model characterizing the effect of leader prime and communalism on the joint effect of changing probability and prize value on participant willingness to pay for lottery tickets.

Note: Leader prime was dummy coded in this analysis, with the control (no prime) condition coded 0. The transformational prime factor therefore characterizes the effect of transformational leadership on the four latent lottery factors compared to the control condition. Likewise, the transactional prime factor characterizes the effect of transactional leadership on the four latent lottery factors compared to the control condition.

Table 5

Study 3: Factor Loadings for the Lottery Task

Intercept	\$10 Prize	\$100 Prize	\$300 Prize	Prize	\$10 Prize	\$100 Prize	\$300 Prize
10% Probability	1	1	1		0	.127	1
50% Probability	1	1	1		0	.127	1
90% Probability	1	1	1		0	.127	1
Probability				Probability x Prize			
10% Probability	0	0	0		0	0	0
50% Probability	.470	.470	.470		0	.170	.252
90% Probability	1	1	1		0	.482	1

Table 6

Study 3: Factors of the Latent Trajectory Model as a Function of Leader Prime and Level of Communalism

	Intercept	Probability	Prize	Probability x Prize
Control (no prime) ¹	.606**	2.890**	21.924**	77.761**
Transformational Prime	.617	1.812*	14.551	42.022*
Transactional Prime	.914	2.590	26.544	59.393
Communalism	.013	-.206	-.029	3.522

* $p < .05$; ** $p < .01$; ¹ The control condition (no prime) group was dummy coded 0; significant effects represent a difference from zero. Significance tests for other prime conditions represent a difference from the control group.

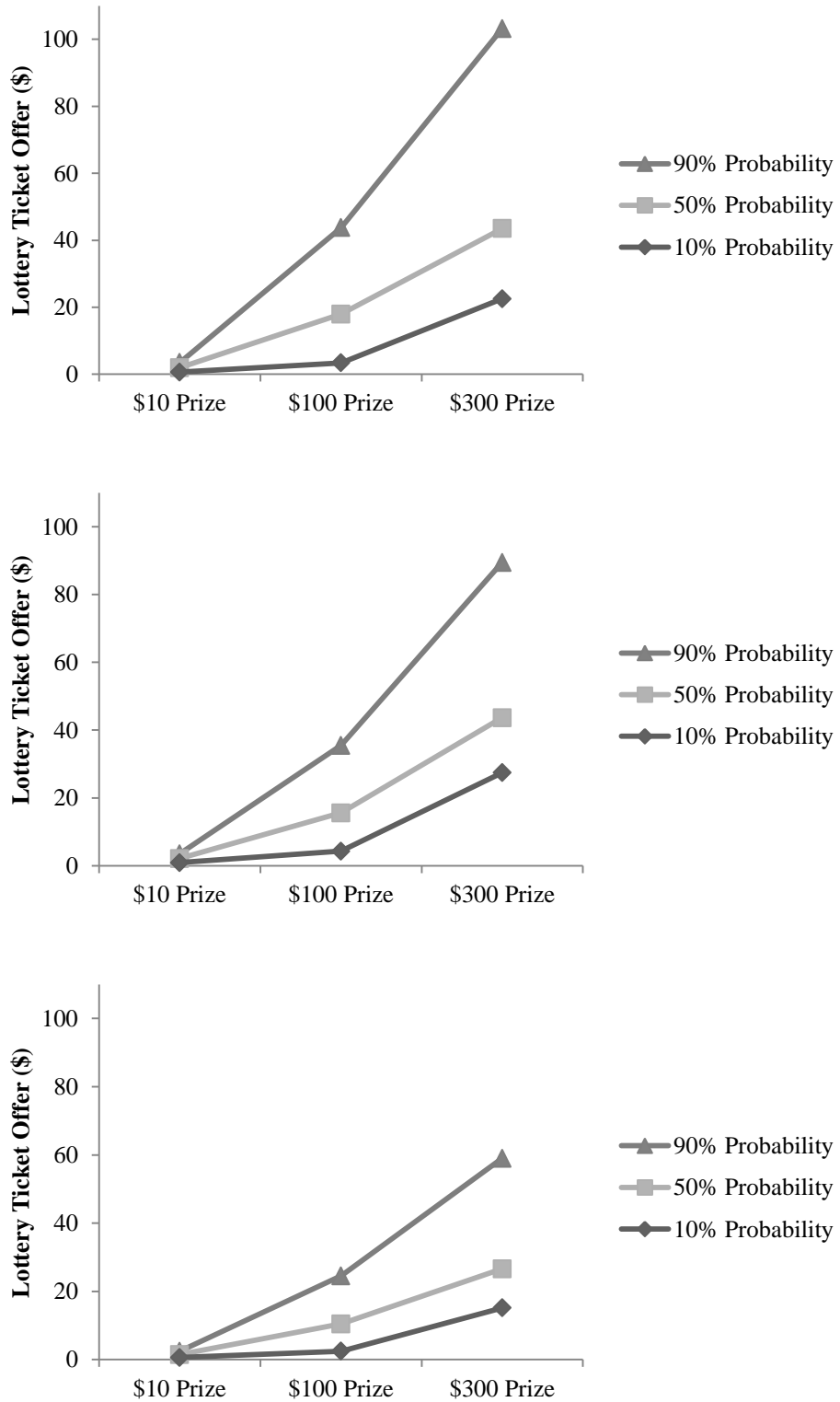


Figure 6. Amount paid for lottery tickets by probability of winning and prize value by participants in the (a) control (b) transactional prime and (c) transformational prime conditions.

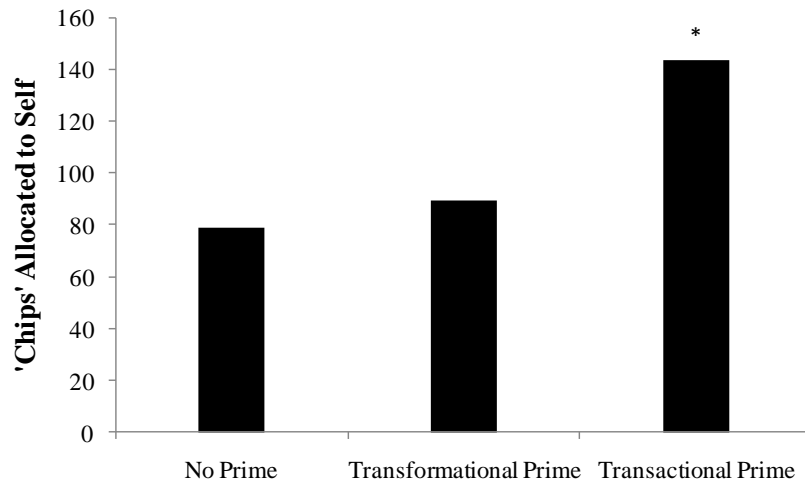


Figure 7. Resources taken from a common pool by leader prime condition.

Note. * $p < .05$.

Discussion

The results for the lottery task confirmed the results of Studies 1 and 2: that participants primed with the transformational leader were less sensitive to the personal risks and rewards associated with different lottery probabilities and prize values, compared to the control and transactional leader conditions, which did not differ from one another. The results for the tragedy of the commons task showed that those in the control condition, who were primed with common everyday objects, did not differ from those primed with the transformational leader, while the transactional leader prime resulted in an increase in self-interest evidenced by these participants' decision to take more resources for themselves from the common pool.

The use of a control condition in Study 3 offered a new insight into the differential effects of transformational and transactional leadership. Previous theoretical accounts and researchers studying this phenomenon have argued that transformational leadership reduces self-interest, however, the results of the present study suggest that whether this is true may depend on the nature of the task or behavior. When individuals are presented with a social dilemma whereby they can benefit themselves by harming the group, participants appeared to want to do what is good for the group, and a transformational leader did not augment this tendency. A transactional leader, on the other hand, appears to increase self-interest as measured with the tragedy of the commons task, possibly as a result of the quid pro quo focus of this leadership style. Interestingly, while this finding appears to run contrary to the norm of self-interest (Miller, 1999), which would suggest that control participants should default to self-interested behaviour, it is consistent with the results of van Dijk and De Cremer (2006). These authors found that participants generally behaved prosocially regardless of their level of self-interest unless they were placed in a position of power, in which case those high in self-interest allocated

significantly more resources to themselves while those low in self-interest behaved as they did before. Interestingly, when the focus is on the sensitivity to personal risk and reward, as in the lottery task, the transformational leader does appear to be influential in decreasing this sensitivity.

Stated a different way, those participants primed with a transformational leader consistently behaved in a prosocial manner, while those participants primed with a transactional leader consistently behaved in a proself manner. The behaviour of those in the control condition appeared to be affected by the nature of the task in which they were engaging; behaving in a prosocial manner in the context of a sharing task (the tragedy of the commons task) and in a proself manner in the context of the lottery task. This suggests that in organizations where teamwork is emphasized, transformational leaders may not have a noticeable effect on reducing concern for personal gain. Alternatively, in those contexts where competition and personal gain are emphasized, transformational leaders may be effective at reducing self-interest. Further experimental research is needed to examine whether these effects are stable and generalize to other behaviors that tap self-interested concerns.

Unlike Study 2, pre-existing values did not moderate the effectiveness of the prime. There are a number of reasons why this may be the case. First, unlike Study 2, which used an extreme groups design to select participants with high and low levels of pre-existing values, Study 3 measured the values during the first experimental session. As a result, there were no participants with moderate levels of communal value orientation in Study 2, while the preponderance of participants in Study 3 had moderate levels of this value. It may be that the moderating effect of pre-existing values is subtle, and so a more powerful design, such as using extreme groups, is necessary to detect it (c.f. Preacher, Rucker, MacCallum, & Nicewander,

2005). Second, Study 3 used a different values measure than Study 2 (i.e., the Portrait Values Questionnaire, as opposed to the Schwartz Values Survey). Although the two measures should measure the same underlying value constructs, the PVQ was developed for use in less academic settings, and thus the SVS may have been more sensitive to the values of university students. Furthermore, the SVS, which asks participants to report the personal importance of abstract value words, such as ‘independent’ and ‘ambitious’ for the values of independence and achievement, may be more suitable for measuring values in the unconscious, or associative, system, whereas the PVQ, which asks participants to describe their similarity to lengthier and more concrete exemplars of values, such as “It is important to him to make his own decisions about what he does. He likes to be free to plan and to choose his activities for himself” may be most suitable for measuring values held in the conscious, or symbolic system. Because the leader prime was presented unconsciously, the values of the unconscious are likely to have been most relevant and most impactful.

Chapter 4

General Discussion

The purpose of the present research was to determine whether the effect of transformational leadership on reducing follower self-interested behaviour found in previous research could be explained by the leader implicitly priming self-transcendent concerns. To investigate this possibility, in each of three studies, I presented participants with descriptions of transformational and transactional leaders and had participants familiarize themselves with these two leaders. Subsequently, participants were subliminally primed with the image of one of the leaders and completed tasks to assess their level of self-interest. The results of Study 1 suggest that priming individuals with a transformational or transactional leader will encourage them to engage in behaviour in accordance with the values espoused by that leadership style. The results of Study 2 suggest that this effect can be generated even several days after learning about such a leader, and that the effectiveness of the prime is moderated by pre-existing values held by the individual. The results of Study 3 both replicate and extend Study 2, and suggest that individuals will behave in a manner consistent with the demands of the task they are given, unless a strong contextual cue (i.e., leader prime) encourages them to do otherwise.

The results of the present studies may have compelling implications for the study of leadership. One of the fundamental functions of leadership is to create and highlight group goals and values (Bass, 2008). This is typically considered an explicit or overt function of leadership. For example, a leader might inspire their followers to pursue particular goals by delivering an inspiring vision of the future. Remarkably, participants in the present set of studies appear to have been encouraged to use particular values in their decision making as a result of the mere sub-conscious presentation of an image of a leader. This suggests that the transmission of goals

and values may not require an overt intervention on the part of the leader, but can instead occur much more subtly through priming the concept of the leader and the resulting activation of the leader's traits in the subordinate's mind. The present research demonstrates that priming leaders' traits in this way can affect follower behaviour and underscores the importance of including this unconscious influence process in modern leadership theory.

Interestingly, the present studies demonstrated this priming effect using leaders with whom participants were merely familiar with, having only briefly learned about the leaders several minutes (Study 1) or days (Studies 2 and 3) prior to priming. In a workplace setting, frequent exposure to a leader may create a context in which followers have both a more robust concept of their leader and their associated goals and values, as well as more chronic exposure to them. This chronic exposure leads to ongoing activation of those goals and values, ultimately producing an enduring influence on the values that are salient to those followers. This effect likely increases the more proximal the leader, due to the increased frequency with which their followers are exposed to both the leader's values and the leader themselves, enhancing both the strength and frequency of the leader's influence through priming.

More traditional conceptions of leadership involving overt leader behaviour can be supplemented by this unconscious influence process. Effective leadership behaviours direct goal pursuit through conscious decision making on the part of the follower to adopt or pursue those goals. Once a goal has been identified by the leader, followers can choose to pursue it. However, in contexts where appropriate action is ambiguous and in the absence of overt direction from the leader, unconscious cognitive processes likely bias behaviour in favour of the values and goals the leader endorses.

A further implication of this research speaks to the effects of the leader's behavioural consistency. The fact that leaders may influence followers by unconsciously activating values the subordinate associates with him or her suggests that those leaders who behave in a manner that is consistent with the values they explicitly support may create a synergy between conscious and unconscious influence, while those who send mixed messages by extolling one ideal while acting in accordance with another create a harmful dissonance between conscious and unconscious influence. In the first case, the follower is subconsciously primed to adopt goals and values that are consistent with the leader's overt influence (e.g., directives), which likely facilitates acceptance and internalization of the associated goals and ultimately leads to more vigorous pursuit of those goals. In the second case, the leader may prime goals that are inconsistent with their overt influence, forcing followers to reconcile the discrepancy between the primed goals and the goals the leader is overtly endorsing, ultimately leading to inconsistent and unenthusiastic pursuit of those goals.

The combination of both overt and unconscious influence processes may help to explain the effectiveness of authentic leaders (Walumbwa, Avolio, Gardner, Wernsing, & Peterson, 2008). Authentic leadership describes a pattern of transparent and ethical leader behavior that encourages openness in sharing information needed to make decisions while accepting followers' inputs (Avolio, Walumbwa, & Weber, 2009) and is comprised of four components: balanced processing, internalized moral perspective, relational transparency, and self-awareness. The last two components are especially relevant to the present research in that the regular presentation of one's authentic self (i.e., relational transparency) leads to increased opportunities to share values while a well-developed understanding of oneself should ensure that the same values are communicated consistently across implicit and explicit channels. Indeed, researchers

have suggested that influence processes that encourage a particular follower self-concept (e.g., through the increased activation of particular values), may enhance the effectiveness of later influence that is consistent with that self-concept (D. van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). In the context of the present research, this suggests that a cue (i.e., leader or other contextual cue) that primes a pro-social identity in followers should enhance leader effectiveness in influencing those followers to engage in pro-social behaviour. Mixed messages, on the other hand, should reduce leader influence by failing to encourage followers to consistently adopt a self-concept that is sensitive to the leader's message. Thus, authentic leaders may be effectively leveraging the subtle values-based influence process under study in the present paper.

Interestingly, the results of the present research may elucidate the nature of the influence of transformational leaders on self-identity, and specifically on the nature of the interdependent self. Researchers have suggested that transformational leaders influence their followers to identify more strongly with their organization, leading to the adoption of an interdependent or communal self-identity (D. van Knippenberg, van Knippenberg, De Cremer, & Hogg, 2004). The self-interest literature suggests that pro-social behaviour (e.g., helping a fellow group member) may reflect a pro-self process in the context of an interdependent or communal self-construal (Folger & Salvador, 2008). Interestingly, the present research suggests that a fundamentally different cognitive process is being used in the decision making of those primed with a transformational leader compared to those primed with a transactional leader. That is, those primed with a transformational leader fail to engage the lottery task in a rational and calculating manner; an outcome we might not expect if participants in this condition continued to be self-interested but simply adopted a recasting of their identity. The lottery task is particularly useful

in this regard, as a dependent variable with a target “other” (e.g., prisoner’s dilemma, organizational citizenship behaviours, etc.) could not provide this insight.

The present research may also have implications for research on priming goal states through significant others (e.g., Shah, 2003). To date, such priming research has predominantly used individuals with whom the participant is very familiar to affect changes in goal states (e.g., mother, or close romantic partner). The present set of studies departed from the robust and well developed other-concepts, and instead used descriptions of individuals with whom the participants were not familiar before their first (Study 2 & 3) or only (Study 1) experimental session. Nevertheless, these descriptions were sufficient to affect participant self-interest despite only a casual familiarity with these individuals. This suggests two things: first, that research on the effect of others on goal pursuit may be conducted without using a significant other that is particular to a given participant. Instead, participant goal pursuit may be affected by standardized other stimulus. Second, a close or robust relationship with another person is not a prerequisite for bringing about changes in goal pursuit, suggesting that the values and ideals of a wide range of “others” may influence the behaviour of individuals.

In addition to its implications for understanding transformational leadership, the current study also suggests a new methodology that can be used to investigate leadership in a laboratory setting. It is undeniable that laboratory research is under-utilized in the study of organizational behaviour. Few studies based on laboratory data are ever published (7.5%, compared to 55% for fieldwork), and this disparity is increasing (Brown & Lord, 1999). When considering the potential benefits that can be derived from laboratory research, such as the ability to determine causation and the potential to study new relationships between variables, the lack of experimental laboratory research in the field of organizational behaviour is unsettling. One

impediment to the investigation of leadership in the laboratory has been the inability of researchers to investigate how real leaders influence their subordinates. In this regard, prior laboratory research has been criticized for its artificiality (Yukl, 2002). In the current paper, particularly Study 1, I demonstrated that the application of social cognitive techniques (i.e., priming) might be effectively used to investigate how real leaders influence their subordinates in a laboratory environment. Thus, future work utilizing priming procedures may help to reduce the disparity that exists between the amount of research done in the laboratory compared to research done in the field.

Limitations and Future Directions

In each of the three studies, vignettes were used to expose participants to the two leadership styles. Although this increases the level of procedural standardization and control, it is unclear whether the results would have changed had the participants become familiar with the same leadership content delivered through a richer leader stimulus. Using a video-based stimulus, a trained confederate, or a participant's own leader would likely have resulted in richer and more robust learning, which may have enhanced the effectiveness of the subliminal prime. Additionally, a confederate or real leader may represent a stronger prime in terms of their interpersonal and instrumental characteristics, further enhancing the effectiveness of these manipulations. It is, perhaps, quite remarkable that the present studies were capable of demonstrating a consistent and influential priming effect for leadership given the nature of the leader stimulus used. Future research should consider more robust leader stimulus to enhance both the generalizability of the results and, perhaps, enhance the power of the manipulation in order to explore the effects of variables that may moderate this effect.

Interestingly, while the leaders presented in the current study were not “real,” the use of vignettes to explore leadership is consistent with distal leaders (e.g., CEOs) as opposed to proximal leaders (e.g., supervisors). Indeed, the vignettes naturally impose a social distance between the leaders presented in the vignettes and the participants reading about them. Shamir (1995) suggests that distal leaders effectively influence their followers in a manner that is different from more proximal leaders. For example, distal leaders may invoke attributions of exceptional qualities more readily than proximal leaders due to the reliance of followers on organizational performance cues, image-building techniques, visionary behaviors, use of rhetoric, and articulation of ideology to develop a view of their leader resulting in a more idealized view of that leader. Proximal leaders, on the other hand, are more likely to generate follower attributions based on actual observations of that leader’s performance, a process that is less conducive to generating an idealized view of the leader. The vignettes used in the present study contained many of the distal cues (e.g., articulation of ideology), and thus closely mirror distal forms of leadership.

While the present studies explored the effect of pre-existing values on the impact of the leader prime, future work should consider possible moderators that may have an impact on the extent to which leaders prime subordinates to adopt particular values. Investigating how factors such as the personality and centrality of values of participants can change the effect of transformational leaders on the activation of self-transcendent values is but one example. De Cremer, Mayer, van Dijke, Schouten and Bardes (2009) have found support for this idea with their research demonstrating that the influence of the leader’s values on prosocial behavior is strongest when followers’ regulatory focus complements the leader’s orientation.

Another important avenue for future research is to examine whether this implicit form of leadership influence extends beyond the effects of transformational and transactional leadership on self-interest to more proximal goals. Interestingly, research by Kelloway, Mullen, and Francis (2006) has explored transformational leadership in the context of a particular domain; in their case, encouraging the pursuit of safety-specific outcomes. They assessed leaders level of transformational leadership as it related to safety-specific messages and outcomes, finding that those leaders who model effective safety behaviours (idealized influence), communicate an appealing safety-related vision (inspirational motivation), encourage creative efforts from followers to enhance safety (intellectual stimulation), and provide support, encouragement, and coaching to followers around safety related concerns (individualized consideration) are associated with higher levels of safety consciousness in their followers, as well as reduced negative safety-related events and injuries. Interestingly, the same study found that safety-specific passive leaders (i.e., leaders who did not influence safety behaviour) produced a *reduction* in employees' safety consciousness, which in turn, was related to more numerous negative safety events and injuries. Kelloway et al. (2006) suggested that leaders who are passive in the domain of safety may lead followers to devalue safety concerns relative to other concerns. In essence, if those same leaders inspire goals in their subordinates that conflict with safety, for example, attaining a high level of productivity, safety concerns may be undermined. The present research suggests that, in the case of safety-specific passive and transformational leadership styles, followers are picking up salient values from their leaders, whether safety-related or otherwise, and using those values to guide their behaviour at work. While these findings are consistent with the results obtained in the present research, whether or not the process by which these leaders influence concern for safety among employees, and whether or not it is consistent

with a dual-process cognitive model, needs to be more fully investigated to understand the mechanism by which this effect occurs and to explore more closely the effects of unconsciously inspiring values that may compete or conflict with safety, or indeed, any proximal goal.

Interestingly, while previous leadership research may be limited because it has focused solely on explicit influence processes, the current research may be limited by a focus solely on the implicit influence processes. While this focus is necessary to explore both the power and robustness of this phenomenon, explicit and implicit influence processes are likely to interact synergistically to enhance leader effectiveness. For example, implicitly priming followers with the concept of a particular leader may increase their sensitivity to explicit instructions that are consistent with the characteristics of that leader concept. Exploring the nature of this interaction likely represents a fruitful direction for future research.

Finally, the present set of studies, conducted in a laboratory setting, have focused on exploring the nature of the implicit influence process. While this may impair the external validity of my findings, the laboratory is ideal for discovering whether this implicit influence process could exist in an effort to deepen our understanding of leadership and explore innovative new techniques for leadership development and training (Ilgen, 1986). In the present case, laboratory research methodologies represent the most appropriate set of techniques for exploring the unconscious phenomenon which was the focus of this series of studies. In contrast, field research, which typically relies on correlational survey data, assumes that respondents are conscious of the key behaviours and factors that have influenced their responses. Field research, therefore, may be ill-suited to the exploration and identification of the subtle influence process which is the focus of the present set of studies (Brown & Lord, 1999). It is worth noting, however, that while the present set of studies demonstrate that the unconscious presentation of a

leader can affect the self-interest of participants, it is unclear whether this process meaningfully affects the behaviour and cognition of followers in applied settings. While it is important to continue the use of laboratory designs to further understand the nature of this subtle influence process, future research should certainly explore whether the results of the present study generalize to the field.

Conclusion

The positive impact of transformational leadership on the productivity and satisfaction of workers is undeniable (Avolio, 1999). Its capacity to generate competitive advantage by encouraging innovation, combined with the added stability and satisfaction afforded to organizations and their members through the self-transcendent corporate culture that this leadership style supports, suggests that transformational leadership's popularity in organizations will continue to grow in the years to come. Clearly, increasing our understanding of this highly important leadership style and the mechanisms through which it exerts influence on followers is important to take full advantage of the benefits of the transformational leadership paradigm. The present paper contributes to our understanding of transformational leadership by highlighting a subtle but impactful mechanism through which this style operates (i.e., priming self-transcendent concerns).

A leader is best when people barely know he exists, not so good when people obey and acclaim him, worse when they despise him... But of a good leader who talks little when his work is done, his aim fulfilled, they will say, "We did it ourselves." (Lao Tzu)

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Appendices

Appendix A: Leader Statements

Please read the following passage on Bob (see Photograph).

Bob is a manager at Torison Inc., a medium-sized manufacturing company. He has held the position for the past five years where he manages a team of six other employees.



Below are 10 on-the-job behaviours that describe the type of leader Bob is.

- Bob only delegates tasks to his workers which he would not enjoy.
- Bob is very busy, and can not always listen to the concerns of his workers.
- Bob asks that all business be conducted “by the book” and thinks that new ideas are a waste of time.
- Bob monitors his workers closely to be sure that they are working as hard as possible.
- Bob is careful to monitor his workers to ensure they have not made any mistakes.
- Bob dislikes having his workers return from their lunch hour more than five minutes late.
- During their weekly meeting, Bob refuses to take up any issues which are not on the agenda.
- Bob typically supports the ideas of only the best of his workers.
- The rewards Bob’s workers receive are fully based on their performance.
- Bob supports a subordinate’s idea for a project, but warns her that she will be accountable should the project fail.

Please read the following passage on Tom (see Photograph).

Tom is a manager at Torison Inc., a medium-sized manufacturing company. He has held the position for the past five years where he manages a team of six other employees.



Below are 10 on-the-job behaviours that describe the type of leader Tom is.

- Tom only delegates tasks to his workers which he would not enjoy.
- Tom is very busy, and can not always listen to the concerns of his workers.
- Tom asks that all business be conducted “by the book” and thinks that new ideas are a waste of time.
- Tom monitors his workers closely to be sure that they are working as hard as possible.
- Tom is careful to monitor his workers to ensure they have not made any mistakes.
- Tom dislikes having his workers return from their lunch hour more than five minutes late.
- During their weekly meeting, Tom refuses to take up any issues which are not on the agenda.
- Tom typically supports the ideas of only the best of his workers.
- The rewards Tom’s workers receive are fully based on their performance.
- Tom supports a subordinate’s idea for a project, but warns her that she will be accountable should the project fail.

Please read the following passage on Bob (see Photograph).

Bob is a manager at Torison Inc., a medium-sized manufacturing company. He has held the position for the past five years where he manages a team of six other employees.



Below are 10 on-the-job behaviours that describe the type of leader Bob is.

- Bob listens attentively to any concerns his workers have.
- Bob encourages his workers to come up with new strategies to conduct better business, and rewards those workers who develop new procedures.
- Bob defends the rights of his workers passionately.
- Bob gives credit for his department's successes to his work team.
- Bob is very free with his compliments when any of his workers does something well.
- Bob begins every section meeting with a motivational talk about the importance of teamwork.
- Most people who work for Bob agree that Bob's excitement about new projects is intoxicating.
- Although Bob works in a large company, he still takes the time to get to know all of his employees.
- Bob delegates exciting high-profile projects to his workers, even though it means less recognition for Bob himself.
- Rather than lay off one of his workers, Bob took a pay cut.

Please read the following passage on Tom (see Photograph).

Tom is a manager at Torison Inc., a medium-sized manufacturing company. He has held the position for the past five years where he manages a team of six other employees.



Below are 10 on-the-job behaviours that describe the type of leader Tom is.

- Tom listens attentively to any concerns his workers have.
- Tom encourages his workers to come up with new strategies to conduct better business, and rewards those workers who develop new procedures.
- Tom defends the rights of his workers passionately.
- Tom gives credit for his department's successes to his work team.
- Tom is very free with his compliments when any of his workers does something well.
- Tom begins every section meeting with a motivational talk about the importance of teamwork.
- Most people who work for Tom agree that Tom's excitement about new projects is intoxicating.
- Although Tom works in a large company, he still takes the time to get to know all of his employees.
- Tom delegates exciting high-profile projects to his workers, even though it means less recognition for Tom himself.
- Rather than lay off one of his workers, Tom took a pay cut.

Appendix B: Impression Formation Task used in Study 1



From the description that you've read about Bob, describe three of the behaviours that you remember him performing. Looking at the picture above may help you remember.

Please write down your thoughts and impressions of Bob.

The following four questions use a five point "Agree" to "Disagree" scale. Circle the choice that most closely represents what you think is the most appropriate reflection of Bob.

	Agree		Neutral		Disagree
Makes personal sacrifices for the benefit of others.	5	4	3	2	1
Instils pride in being associated with him.	5	4	3	2	1
Talks enthusiastically about what needs to be accomplished.	5	4	3	2	1
Emphasizes the importance of having a collective sense of mission.	5	4	3	2	1



From the description that you've read about Tom, describe three of the behaviours that you remember him performing. Looking at the picture above may help you remember.

Please write down your thoughts and impressions of Tom.

The following four questions use a five point "Agree" to "Disagree" scale. Circle the choice that most closely represents what you think is the most appropriate reflection of Tom.

	Agree		Neutral		Disagree
Makes personal sacrifices for the benefit of others.	5	4	3	2	1
Instils pride in being associated with him.	5	4	3	2	1
Talks enthusiastically about what needs to be accomplished.	5	4	3	2	1
Emphasizes the importance of having a collective sense of mission.	5	4	3	2	1

Appendix C: Leader Descriptions



My name is Joe Hewlett, and I'm the 1997 recipient of the Award for Management Excellence and president of Rural Distribution Services. RDS distributes agricultural equipment to farmers in rural communities. RDS began operations 3 years ago in the town of Parsons Kansas, and has expanded to serve over 200 rural communities today. RDS is currently the number-one provider of agricultural equipment to rural communities in the western United States.

My management at RDS is driven by our mission, our values, and our beliefs. Our mission reminds us of the purpose for which we exist. A strong sense of purpose keeps us focused on what is important.

While our purpose and mission determine the direction of the organization, our core beliefs and values guide us in setting policy and making decisions. It is important that we remember our mission, beliefs, and values on a daily basis.

Our values are guides that we use to ensure that our decisions are based on moral principles, not economic factors. We do whatever it takes to provide services consistent with our purpose and values. Our best employees are those who are committed to doing what is right and finding a way to make it work. By coaching, supporting and encouraging them, employees can realize their full potential and build the strength of our workforce. By promoting communication and flexibility in employees, we can encourage workers to view problems from a fresh perspective, and with a new increased awareness, allow for innovation.

To achieve our mission, all of our employees must remain conscious of the common purpose for which we have come together. We must work together to fulfill our mission in accordance with our core values and beliefs.



My name is Jack Laston, and I'm the 1998 recipient of the Award for Management Excellence and president of Collinson Feed Services. CFS provides cattle feed and feeding systems to individuals in rural communities. CFS began operations 5 years ago in the small town of Crawford Nebraska, and has expanded to serve over 400 rural communities today. CFS is the number-one provider of feeding systems to rural communities in the western United States.

My management at CFS is determined by our goals, our needs, and our customers. Our strength is established by our procedures and our ability to meet the needs of our clients. Focus on maintaining successful and efficient systems keep us profitable.

While our procedures and systems determine the operation of the organization, our attention to changes in the market guide us in setting policy and making decisions. It is essential that we work to realize our goals on a daily basis.

Our procedures are guides that we use to ensure that our decisions are based on economic principles, not emotional factors. We do whatever it takes to provide services consistent with our goals and procedures. Our best employees are those who are committed to working towards their own success by effectively supporting our company. Employees must know the work that needs to be accomplished. Rewards and incentives are key to motivating workers to meet expectations, and correction or punishment must be used as a response to unacceptable performance or deviation from the standards. Careful monitoring is key to maintaining an efficient workplace.

To achieve success, all of our employees must remain conscious of the function our company fulfills. We must work hard to achieve our goals in accordance with our needs and the market situation.

Appendix D: Impression Formation Task used in Studies 2 and 3



Please put a mark in the box under the individual who you think is **most likely** to perform each behaviour.



<input type="checkbox"/>	Worked late all week in order to finish the project.	<input type="checkbox"/>
<input type="checkbox"/>	Always shows concern for the well being of the team.	<input type="checkbox"/>
<input type="checkbox"/>	When speaking, motivates employees.	<input type="checkbox"/>
<input type="checkbox"/>	Even when the employees do not communicate that they're upset, it is still perceived.	<input type="checkbox"/>
<input type="checkbox"/>	Displays extraordinary talent and competence in every project.	<input type="checkbox"/>
<input type="checkbox"/>	Does not give up on a project when complications arise.	<input type="checkbox"/>
<input type="checkbox"/>	Argues until co-workers see the ideas.	<input type="checkbox"/>
<input type="checkbox"/>	Always makes sure that credit is not taken for employee's good ideas.	<input type="checkbox"/>
<input type="checkbox"/>	Encourages employees to approach if a problem arises.	<input type="checkbox"/>
<input type="checkbox"/>	Extends employees deadlines when they have important family commitments.	<input type="checkbox"/>
<input type="checkbox"/>	Emphasizes that the team needs to be number one.	<input type="checkbox"/>
<input type="checkbox"/>	Is accommodating when family emergencies arise.	<input type="checkbox"/>
<input type="checkbox"/>	Works on projects outside of working hours.	<input type="checkbox"/>
<input type="checkbox"/>	Goes beyond self-interest for the good of the employees.	<input type="checkbox"/>
<input type="checkbox"/>	Talks enthusiastically to the employees about what needs to be accomplished.	<input type="checkbox"/>
<input type="checkbox"/>	Is responsive to the feelings of employees at work.	<input type="checkbox"/>
<input type="checkbox"/>	Consistently contributes good ideas during group discussions.	<input type="checkbox"/>
<input type="checkbox"/>	Works relentlessly to solve difficult problems.	<input type="checkbox"/>
<input type="checkbox"/>	Fights to get the work group necessary resources.	<input type="checkbox"/>
<input type="checkbox"/>	Is always upfront with subordinates.	<input type="checkbox"/>
<input type="checkbox"/>	Listens when subordinates are having a personal conflict.	<input type="checkbox"/>
<input type="checkbox"/>	In a personal crisis gives time off to his employees.	<input type="checkbox"/>
<input type="checkbox"/>	Wants own ideas to be heard before other employees' ideas are heard.	<input type="checkbox"/>
<input type="checkbox"/>	Expresses concern with subordinates that are going through difficult times.	<input type="checkbox"/>



From the description that you've read about the above individual, describe three of the behaviours that you remember him performing. Looking at the picture above may help you remember.

Please write down your thoughts and impressions of this individual.



From the description that you've read about the above individual, describe three of the behaviours that you remember him performing. Looking at the picture above may help you remember.

Please write down your thoughts and impressions of this individual.

Consider what you know about the individual represented in the picture. Using the information we have provided you, along with your own impressions of him, decide how appropriate each statement is in describing this individual.



	Not at all like him		Somewhat like him		Exactly like him
	1	2	3	4	5
1. Instills pride in being associated with him.	1	2	3	4	5
2. Discusses in specific terms who is responsible for achieving performance targets.	1	2	3	4	5
3. Aspires to personal greatness.	1	2	3	4	5
4. Makes personal sacrifices for the benefit of others.	1	2	3	4	5
5. Honesty is very central to his character.	1	2	3	4	5
6. Focuses attention on irregularities, mistakes, exceptions, and deviations from standards.	1	2	3	4	5
7. Avoids making decisions.	1	2	3	4	5
8. Talks enthusiastically about what needs to be accomplished.	1	2	3	4	5
9. Is effective in meeting organizational requirements.	1	2	3	4	5
10. Willing to forgive the failures of his workers.	1	2	3	4	5
11. Developing greater personal influence is important to him.	1	2	3	4	5
12. Is absent when needed.	1	2	3	4	5
13. Frequently exercises his right to lead or command.	1	2	3	4	5
14. Equality is a guiding principle in his life.	1	2	3	4	5
15. Makes clear what you can expect to receive when performance goals are achieved.	1	2	3	4	5
16. Waits for things to go wrong before taking action.	1	2	3	4	5
17. Emphasizes the importance of having a collective sense of mission.	1	2	3	4	5
18. Concerned with maintaining his public image.	1	2	3	4	5
19. Delays responding to urgent questions.	1	2	3	4	5
20. Justice in the workplace is important to him.	1	2	3	4	5

Consider what you know about the individual represented in the picture. Using the information we have provided you, along with your own impressions of him, decide how appropriate each statement is in describing this individual.



	Not at all like him		Somewhat like him		Exactly like him
	1	2	3	4	5
1. Instills pride in being associated with him.	1	2	3	4	5
2. Discusses in specific terms who is responsible for achieving performance targets.	1	2	3	4	5
3. Aspires to personal greatness.	1	2	3	4	5
4. Makes personal sacrifices for the benefit of others.	1	2	3	4	5
5. Honesty is very central to his character.	1	2	3	4	5
6. Focuses attention on irregularities, mistakes, exceptions, and deviations from standards.	1	2	3	4	5
7. Avoids making decisions.	1	2	3	4	5
8. Talks enthusiastically about what needs to be accomplished.	1	2	3	4	5
9. Is effective in meeting organizational requirements.	1	2	3	4	5
10. Willing to forgive the failures of his workers.	1	2	3	4	5
11. Developing greater personal influence is important to him.	1	2	3	4	5
12. Is absent when needed.	1	2	3	4	5
13. Frequently exercises his right to lead or command.	1	2	3	4	5
14. Equality is a guiding principle in his life.	1	2	3	4	5
15. Makes clear what you can expect to receive when performance goals are achieved.	1	2	3	4	5
16. Waits for things to go wrong before taking action.	1	2	3	4	5
17. Emphasizes the importance of having a collective sense of mission.	1	2	3	4	5
18. Concerned with maintaining his public image.	1	2	3	4	5
19. Delays responding to urgent questions.	1	2	3	4	5
20. Justice in the workplace is important to him.	1	2	3	4	5

Appendix E: Lottery task

Below is a list of nine lottery scenarios. Please carefully consider each scenario and then enter your answer in the space provided.

What is the most you would be willing to pay for a lottery ticket with a 90% chance of winning \$100?

What is the most you would be willing to pay for a lottery ticket with a 50% chance of winning \$100?

What is the most you would be willing to pay for a lottery ticket with a 90% chance of winning \$300?

What is the most you would be willing to pay for a lottery ticket with a 10% chance of winning \$10?

What is the most you would be willing to pay for a lottery ticket with a 50% chance of winning \$10?

What is the most you would be willing to pay for a lottery ticket with a 10% chance of winning \$100?

What is the most you would be willing to pay for a lottery ticket with a 50% chance of winning \$300?

What is the most you would be willing to pay for a lottery ticket with a 10% chance of winning \$300?

What is the most you would be willing to pay for a lottery ticket with a 90% chance of winning \$10?

Appendix F: Tragedy of the commons task

Resource allocation task - Instructions

Welcome to the resource allocation task! Please read the following instructions carefully:

Imagine that you are a member of a four person group which has a collective resource of 400 'chips' which you must divide amongst yourselves. You will each take turns deciding how many chips to take for yourself from this pool of 400 chips, with the order in which group members decide determined randomly. After all group members have made their decision, the remaining chips will be doubled and divided evenly amongst you and the other three group members.

Taking turns:

The order in which group members allocate chips is chosen randomly. The group member selected to go first will make a decision about how many chips to allocate to themselves. After the first group member's decision, the collective pool will be adjusted (i.e., the collective pool will be reduced by the number of chips that the first group member allocated to himself or herself). After being informed of the remaining number of chips, the second member will make his or her decision. After subsequent adjustments of the resource, the third member will decide and finally the fourth member will decide. The remaining chips will then be doubled and shared among all group members.

Notes about distribution of chips:

If you and your other group members decide to leave all your chips in the common pool then, as a group, you will earn twice as many chips (i.e., 800 total).

If you and your other group members take all 400 chips out of the pool, no chips will be doubled.

The first three group members to make a decision cannot guarantee that they will receive a share of any chips left in the common pool, since later member(s) may allocate all remaining chips to themselves. This is not true for the fourth group member; any resources left in the common pool by the fourth group member will be doubled and shared.

To be sure that you understand this task, please answer the following questions:

What is the largest number of chips that you could possibly get? (Answer: 400 if all the chips are in the common pool at the time you decide, and you allocate all those chips to yourself)

What is the largest number of chips that the whole group could possibly get? (Answer: 800 if you leave all the chips in the common pool, and everyone else does the same)

If you were the fourth person to decide and found that 100 chips were left in the common pool, and you decided to take 50 chips, how many chips would you get once the task was complete? (Answer: 75 -> 50 you allocated to yourself, then the remaining chips are doubled ($50 \times 2 = 100$) and you get a quarter share of that; an additional 25 chips).

****All participants will be shown the answers before proceeding with incorrect answers highlighted****

----- New page -----

Resource allocation task – Task ****Participants are always chosen to decide first****

As described previously, imagine that you are a member of a four person group which has a collective resource of 400 'chips' which you must divide amongst yourselves.

You have been chosen to decide first. There are 400 chips remaining in the common pool.

How many chips will you allocate to yourself? _____

Appendix G: Schwartz Values Survey

Instructions: Using the scale below, indicate the degree to which you rate each of the following items AS A GUIDING PRINCIPLE IN YOUR LIFE.

-1	0	1	2	3	4	5	6	7
opposed to my values	not important			important			very important	of supreme importance

- ___ EQUALITY (equal opportunity for all)
- ___ SOCIAL POWER (control over others, dominance)
- ___ PLEASURE (gratification of desires)
- ___ SENSE OF BELONGING (feeling that others care about me)
- ___ SOCIAL ORDER (stability of society)
- ___ AN EXCITING LIFE (stimulating experiences)
- ___ POLITENESS (courtesy, good manners)
- ___ WEALTH (material possessions)
- ___ NATIONAL SECURITY (protection of my nation from enemies)
- ___ CREATIVITY (uniqueness, imagination)
- ___ A WORLD AT PEACE (free of war and conflict)
- ___ RESPECT FOR TRADITION (preservation of time-honoured traditions)
- ___ SELF-DISCIPLINE (self-restraint, resistance to temptation)
- ___ FAMILY SECURITY (safety for loved ones)
- ___ A VARIED LIFE (filled with challenge, novelty, and change)
- ___ AUTHORITY (the right to lead or command)
- ___ TRUE FRIENDSHIP (close, supportive friends)
- ___ SOCIAL JUSTICE (correcting injustice, care for the weak)
- ___ INDEPENDENT (self-reliant, self-sufficient)
- ___ LOYAL (faithful to my friends, group)
- ___ AMBITIOUS (hardworking, aspiring)
- ___ BROAD-MINDED (tolerant of different ideas and beliefs)
- ___ DARING (seeking adventure, risk)
- ___ CHOOSING OWN GOALS (selecting own purpose)
- ___ CAPABLE (competent, effective, efficient)
- ___ ACCEPTING MY PORTION IN LIFE (submitting to life's circumstances)
- ___ HONEST (genuine, sincere)
- ___ PRESERVING MY PUBLIC IMAGE (protecting my "face")
- ___ OBEDIENT (dutiful, meeting obligations)
- ___ INTELLIGENT (logical, thinking)
- ___ HELPFUL (working for the welfare of others)
- ___ ENJOYING LIFE (enjoying food, sex, leisure, etc.)
- ___ DEVOUT (holding religious faith and belief)
- ___ FORGIVING (willing to pardon others)
- ___ SUCCESSFUL (achieving goals)
- ___ CLEAN (neat, tidy)

Appendix H: Portrait Values Questionnaire

*** Note: the item gender was matched to the participant gender ***

Here we briefly describe some people. Please read each description and think about how much each person is or is not like you. Please indicate how much the person in the description is like you.

	HOW MUCH LIKE YOU IS THIS PERSON?					
	Very much like me	like me	some - what like me	a little like me	not like me	not like me at all
1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. It is important to him to be rich. He wants to have a lot of money and expensive things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. He thinks it is important that every person in the world be treated equally. He believes everyone should have equal opportunities in life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. It's very important to him to show his abilities. He wants people to admire what he does.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. He thinks it is important to do lots of different things in life. He always looks for new things to try.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. He thinks it's important not to ask for more than what you have. He believes that people should be satisfied with what they have.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. It is important to him to make his own decisions about what he does. He likes to be free to plan and to choose his activities for himself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. It's very important to him to help the people around him. He wants to care for their well-being.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Being very successful is important to him. He likes to impress other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. It is very important to him that his country be safe. He thinks the state must be on watch against threats from within and without.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. He likes to take risks. He is always looking for adventures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HOW MUCH LIKE YOU IS THIS PERSON?

	Very much like me	like me	some - what like me	a little like me	not like me	not like me at all
17. It is important to him to be in charge and tell others what to do. He wants people to do what he says.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. He strongly believes that people should care for nature. Looking after the environment is important to him.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Religious belief is important to him. He tries hard to do what his religion requires.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. It is important to him that things be organized and clean. He really does not like things to be a mess.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. He thinks it's important to be interested in things. He likes to be curious and to try to understand all sorts of things.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23. He believes all the worlds' people should live in harmony. Promoting peace among all groups in the world is important to him.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24. He thinks it is important to be ambitious. He wants to show how capable he is.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25. He thinks it is best to do things in traditional ways. It is important to him to keep up the customs he has learned.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26. Enjoying life's pleasures is important to him. He likes to 'spoil' himself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27. It is important to him to respond to the needs of others. He tries to support those he knows.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28. He believes he should always show respect to his parents and to older people. It is important to him to be obedient.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29. He wants everyone to be treated justly, even people he doesn't know. It is important to him to protect the weak in society.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. He likes surprises. It is important to him to have an exciting life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. He tries hard to avoid getting sick. Staying healthy is very important to him.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Getting ahead in life is important to him. He strives to do better than others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Forgiving people who have hurt him is important to him. He tries to see what is good in them and not to hold a grudge.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. It is important to him to be independent. He likes to rely on himself.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Having a stable government is important to him. He is concerned that the social order be protected.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. It is important to him to be polite to other people all the time. He tries never to disturb or irritate others.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. He really wants to enjoy life. Having a good time is very important to him.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. It is important to him to be humble and modest. He tries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

HOW MUCH LIKE YOU IS THIS PERSON?

Very	like	some	a	not	not
much	me	-	little	like	like
like		what	like	me	me
me		like	me		at all
		me			

not to draw attention to himself.

39. He always wants to be the one who makes the decisions.
He likes to be the leader.

40. It is important to him to adapt to nature and to fit into it.
He believes that people should not change nature.