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The When (and How) of Intergroup Competition and Discrimination: Distinguishing the Contributions of Competitive Perceptions and Motivations

Matthew A. Maxwell-Smith
The University of Western Ontario

Supervisor
Dr. Clive Seligman
The University of Western Ontario

Graduate Program in Psychology
A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy
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THE WHEN (AND HOW) OF INTERGROUP COMPETITION AND
DISCRIMINATION: DISTINGUISHING THE CONTRIBUTIONS OF COMPETITIVE
PERCEPTIONS AND MOTIVATIONS

(Spine title: Intergroup Competition And Discrimination)

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by

Matthew A. Maxwell-Smith

Graduate Program in Psychology

A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

The School of Graduate and Postdoctoral Studies
Western University
London, Ontario, Canada

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CERTIFICATE OF EXAMINATION

Supervisor

Dr. Clive Seligman

Supervisory Committee

Dr. Christopher Roney

Dr. Bertram Gawronski

Examiners

Dr. James Olson

Dr. Bertram Gawronski

Dr. Anton Allahar

Dr. Ramona Bobocel

The thesis by

Matthew Andrew Maxwell-Smith

entitled:

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Date _____

Chair of the Thesis Examination Board

Abstract

A new framework is proposed to examine the effects of intergroup competition on discrimination by assessing the influence of participants' subjective construal of potentially competitive events. It posits that competitive intergroup perceptions (CIP; the perception that one's ingroup and another group(s) are attempting to gain a reward or desired outcome at the expense of each other) and competitive intergroup motivations (CIM; the desire for one's ingroup to acquire more of a reward than the other group(s)) are related but distinct constructs. This distinction implies that CIP and CIM should be strongly related, but not to the point of suggesting they are the same variable. A distinction between CIP and CIM also implies that both constructs can be elicited and experimentally manipulated independently of each other. Most importantly, this distinction implies that both constructs will have unique influences on intergroup behaviour. Although this approach has not been systematically investigated previously, the intergroup relations literature suggests two potential explanations by which CIP and CIM may lead to discrimination: i) CIP and CIM have unique, additive effects on intergroup discrimination (the independence perspective); and ii) CIM is the primary contributor to discrimination, such that CIM is more strongly related with discriminatory behaviour than CIP, and that CIP leads to discriminatory behaviour only when CIM is strong (the motivational perspective).

These ideas were examined in three studies that assessed and/or manipulated self-reported CIP and CIM within an intergroup context, then assessed discriminatory intentions or behaviour towards a relevant outgroup. The results of these studies collectively supported the construct validity of the proposed framework: CIP and CIM

were positively and non-redundantly related with each other, affected to differing degrees by experimental manipulations that were designed for each variable, and had generally distinct influences on intergroup behaviour. Studies 1-3 generally attested to the primary role of CIM over CIP in predicting intergroup discrimination; however, Studies 2-3 illustrated that experimentally-augmented levels of CIM did not lead to very strong discriminatory behaviour without high levels of CIP. The proposed framework may be instrumental in generating more thorough insights on the processes and social consequences of competitive group dynamics.

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The When (and How) of Intergroup Competition and Discrimination:

Distinguishing the Contributions of Competitive Perceptions and Motivations

“Competition in armament, both land and naval, is not only a terrible burden upon the people, but I believe it to be one of the greatest menaces to the peace of the world.” Frank B. Kellogg

“Just as predatory animals follow a similar general design and behave in similar ways, so organizations, especially those in competition with one another, must follow certain design principles if they are to succeed and prevail.” Robert Shea

“The existing principle of selfish interest and competition has been carried to its extreme point; and, in its progress, has isolated the heart of man, blunted the edge of his finest sensibilities, and annihilated all his most generous impulses and sympathies.” Francis Wright

“I think life is sort of like a competition, whether it's in sports, or it's achieving in school, or it's achieving good relationships with people. And competition is a little bit of what it's all about.” Sanford I. Weill

“America and Islam are not exclusive and need not be in competition. Instead, they overlap, and share common principles of justice and progress, tolerance and the dignity of all human beings.” Barack Obama

“When you think of all the conflicts we have - whether those conflicts are local, whether they are regional or global - these conflicts are often over the management, the distribution of resources. If these resources are very valuable, if these resources are scarce, if these resources are degraded, there is going to be competition.” Wangari Maathai

The above quotes illustrate that intergroup competition is present in many aspects of our lives. Many people are introduced to it in the form of athletic or academic team contests at school. In the private sector, companies continually try to outperform each other for profit, market share, or to remain in business. At the societal and international levels, different social groups within a nation, or different nations altogether, compete for access to territory, resources, or political power. People may also *experience* competition in a variety of ways, from the overt recognition or perception of competition between

relevant groups, to feeling or acting competitively toward other outgroup members. And as may be expected, there is wide variety of opinions and research on the importance, value, and social consequences of intergroup competition.

Social psychology research has suggested, for the most part, that competition between groups is associated with destructive social consequences. However, the contexts and features of intergroup competition vary widely, and some research shows that competition does not always lead to intergroup hostility. In addition, people's subjective experience of intergroup competition may operate in terms of their perception, motivation, or behaviour within a competitive context, or even their opinion of competition in general. Perhaps as a result, researchers have defined or operationalized intergroup competition, and more broadly, the competition construct, in many different ways.

The current research has two overarching goals: to gain more thorough and precise insights on the nature and operation of competition in the context of intergroup dynamics, and to understand when and how intergroup competition leads to intergroup discrimination. The present research is guided by a new conceptual framework that emphasizes the impact of people's subjective construal of potentially competitive events, and proposes a necessary distinction between competitive intergroup perceptions and competitive intergroup motivations. This framework may be instrumental in understanding when and how intergroup competition leads to intergroup hostility and discrimination.

Competition and Intergroup Relations

The topic of how competitive intergroup goal structures influence behaviour has received much attention in the intergroup relations literature and, to varying degrees, has been addressed by research on social interdependence theory (Deutsch, 1949, 2006; Johnson & Johnson, 2005), realistic group conflict theory (Levine & Campbell, 1972; Sherif, 1966), social identity theory (Tajfel & Turner, 1986), social dominance theory (Sidanius & Pratto, 1999; Sidanius, Pratto, van Laar, & Levin, 2004), and other relevant individual difference variables such as ingroup nationalism (Federico, Golec, & Dial, 2005; Mummendey, Klink, & Brown, 2001), narcissism (de Zavala, Cichocka, Eidelson, & Jayawickreme, 2009) and fusion (Gómez, Brooks, Buhrmester, Vázquez, & Jetten, 2011). The majority of theories and research in this area suggests that competitive intergroup goal structures result in negative or hostile intergroup attitudes and behaviour (for reviews see Esses, Dovidio, Jackson, & Armstrong, 2001; Hewstone, Rubin, & Willis, 2002; Jackson, 1993; Johnson & Johnson, 2005; Pratto, Sidanius, & Levin, 2006).

Social interdependence theory essentially states that competitive goal structures produce more negative attitudes and hostility between participants and result in more destructive outcomes than cooperative goal structures. Multiple reviews and meta-analyses of this research suggest that cooperative goal structures are associated with more positive attitudes and relationships and more cooperative behaviour between participants than competitive or individualistic goal structures (Johnson & Johnson, 1989, 2005; Roseth, Johnson & Johnson, 2008; Stanne, Johnson & Johnson, 1999); however, the majority of this research has focused on how cooperative versus competitive goal structures affect education, achievement, and interpersonal relationships rather than

intergroup dynamics. This research has also typically not compared competitive goal structures with individualistic goal structures in which the presence of another outgroup is acknowledged, but there is no outcome interdependence between the groups (e.g., Deutsch, 1949; Kahn & Ryen, 1972; Kennedy & Stephan, 1977; Taylor & Moriarity, 1987).

Realistic group conflict theory (RGCT) states that “real conflict of group interests causes intergroup conflict” (Campbell, 1965, p. 287), and suggests that intergroup discrimination can be traced to intergroup competition over scarce resources (Campbell, 1965; Levine & Campbell, 1972; Sherif, 1966). This theory is partially based on the Robbers’ Cave study (Sherif, Harvey, White, Hood, & Sherif, 1961) that placed young boys into separate, neighbouring camps, pitted the two groups against each other over a series of competitive events for food, territory and access to camp resources, and found very high levels of hostilities between the two groups that included fights and destruction of their rivals’ living space and property. Other contemporary research has observed that perceived intergroup competition over material resources, such as jobs, wealth, political power, or land is associated with greater enmity between groups (Jackson & Esses, 2000; for a review see Jackson, 1993). RGCT has been criticized, however, for its limited discussion and emphasis on the role of social or ingroup identification—the perceived centrality of the group to one’s identity (Tajfel & Turner, 1986)—in producing intergroup discrimination.

In contrast, research derived from social identity theory (SIT) suggests that people are naturally motivated to seek or achieve a positive social identity for their ingroup(s), which could lead to biased perceptions and discrimination on behalf of their ingroup even

when such behaviour would not result in their ingroup obtaining scarce material resources (Tajfel & Turner, 1986; Turner, Brown, & Tajfel, 1979). Much evidence for this theory is derived from studies that have used the minimal-groups paradigm (MGP) of assigning participants to groups based on arbitrary or artificial criteria, and observed relatively high levels of ingroup bias in attitudinal and resource allocation measures, despite an absence of overt competition between the groups (see reviews by Brown, 2000; Tajfel & Turner). Other research has also shown that ingroup identification predicted biased attitudes and intergroup discrimination, although this relation has not been very consistent or robust across studies (Brown, 2000; Ellemers, Spears, & Doosje, 2002; Hewstone, Rubin, & Willis, 2002). SIT is a broad theory that also includes predictions on how other variables such as the stability and legitimacy of the intergroup relationship, group status, and the ability to leave an ingroup to join an outgroup, may affect ingroup bias and discrimination. As such, there is relatively little research on the effects of varying the presence of competition in MGP studies, and a recent meta-analysis showed that presenting competitive versus individualistic settings in MGP studies did not increase discriminatory behaviour above chance levels (Jetten, Spears, & Postmes, 2004).

Contemporary models of intergroup conflict have since integrated the desire for one's group to possess material resources and a positive group identity. Stephan and Stephan (1996) and their colleagues (Corenblum & Stephan, 2001; Stephan et al., 2002; Stephan, Renfro, Esses, Stephan, & Martin, 2005) have argued and shown that the perception of conflict with the outgroup over scarce resources, and the perception that the outgroup has different beliefs and values than the ingroup, constitute threats that are associated with greater outgroup prejudice. Scheepers and his colleagues (Scheepers,

Spears, Doosje, & Manstead, 2006a; Scheepers, Spears, Doosje, & Manstead, 2003, 2006b) have shown that symbolically expressing a positive group identity and actively discriminating on behalf of one's group for material resources constitute two distinct functions for maintaining the identity of the ingroup, and that the emergence of either function will depend on the features of the current intergroup relationship (e.g., ingroup versus outgroup status, stability of status, degree of accountability to the outgroup). Most of this research has not, to date, experimentally manipulated the presence or absence of competition. One exception is Study 1 of Stephan et al. (2005), in which the presence of realistic and symbolic threats only increased negative attitudes toward the target immigrant group when both threats were present, rather than when both were absent or only one present.

Other relevant research paradigms have investigated the role of individual difference variables in group conflict. Research on social dominance orientation (SDO)—a generalized ideological orientation towards and desire for unequal and hierarchical relations among salient social groups (Pratto, Sidanius, Stallworth, & Malle, 1994)—has shown that individuals who score high on SDO scales report more negative attitudes toward minority and stigmatized groups in society (Pratto, Sidanius, & Levin, 2006; Pratto et al., 1994), and are more likely to discriminate on behalf of their ingroup (Amiot & Bourhis, 2005; Pratto, Sidanius, & Levin; Sidanius, Haley, Molina, & Pratto, 2007). Similarly, individuals who have a high level of SDO or a strong nationalistic belief in the superiority of their country over other countries have demonstrated a stronger tendency toward more negative outgroup attitudes and discriminatory behaviour, particularly when an intergroup comparison or competitive context is made salient (Dru, 2007; Cozzolino

& Snyder, 2008; Federico, Golec, & Dial, 2005; Mummendey, Klink, & Brown, 2001; Pratto & Glasford, 2008). Much of this research is contextualized within the relationships among relevant cultural, societal and political groups, and has not explicitly examined how these variables, in conjunction with the absence or presence of intergroup competition affected intergroup discrimination.

Much of the extant research and theory collectively suggests, therefore, that intergroup competition produces greater prejudice or discrimination for a variety of reasons (e.g., material resources, social identity or status, or individual needs). In contrast, some articles in the literature have revealed that interpersonal or intergroup competition is not always associated with hostility between competitors. That is, some studies have shown that contexts of intergroup competition did not affect or worsen participants' evaluations of or behaviour toward the target group(s) relative to conditions in which the relationship between groups was cooperative, or independent (Brewer & Silver, 1978; Brown, 1984; Brown & Abrams, 1986; Jetten, Spears, & Postmes, 2004; Judd & Park, 1988; Rabbie & de Brey, 1971; Tyerman & Spencer, 1983). A cross-cultural review by Bonta (1997) also found that although societies with greater levels of competition tend to show higher violence and crime rates than cooperative societies, some societies which practiced relatively high levels of competitive rituals and business practices had fairly low crime rates as long as there was a strong, shared, cultural belief in nonviolence. These findings are not consistent with the predictions of RGCT or SIT, yet they have received relatively little attention.

Understanding *when* competition is likely to produce intergroup animosity is additionally complicated by the fact that contemporary studies have used a wide variety

of conceptual definitions for intergroup competition. This construct has been operationalized, or referred to as an experimentally induced competitive situation (Esses, Dovidio, Jackson, & Armstrong, 2001; Holtz & Miller, 2001; Judd & Park, 1988; Ruscher, Fiske, Miki, & Van Manen, 1991), a competitive desire to have more resources or social status than another group (Duckitt, 2006; Louis, Duck, Terry, Schuller, & Lalonde, 2007; Thomsen, Green, & Sidanius, 2008), the perception of a competitive, or a zero-sum resource distribution arrangement with another group (Goren, 2001; Jackson & Esses, 2000; Jackson & Smith, 1999; Leach & Spears, 2008; Pratto & Glasford, 2008), a competitive mindset or processing style (Sassenberg, Moskowitz, Jacoby, & Hansen, 2007) or competitive behaviour performed on behalf of one's group (Amiot & Bourhis, 2005; Grieve & Hogg, 1999; Tajfel & Turner, 1986).

Given the wide variety of competition construct definitions and the inconsistent effects of intergroup competition on intergroup discrimination and hostility, the effects and outcomes of intergroup competition are unclear. Because intergroup competition has been structured or conceptualized in a diverse number of ways, a comprehensive framework that includes clear construct definitions of competition would be helpful in guiding research toward achieving a full understanding of the effects and social consequences of intergroup competition and, more broadly, competition as a whole. Unfortunately, an integrative framework with clear conceptual definitions of competition is lacking (Johnson & Johnson, 2005; Sommer, 1995). This has led some observers to comment that competition research lacks a broad theory (Buskist & Morgan, 1988; Martens, 1975), and may partially account for why the number of published studies on the effects of competition has declined since the 1980s (Johnson & Johnson, 2005). This

current state of affairs is problematic if we are to understand how and when competitive intergroup goal structures lead to destructive social consequences.

To address this need, the current research is based on a new conceptual framework that includes a set of specific variables that are designed to reflect the influence of competitive intergroup processes, in order to systematically guide research on intergroup competition and to precisely estimate its potentially positive and negative consequences. This framework was designed to provide clear conceptual definitions of competitive processes, and to generate testable hypotheses of how and when intergroup competition leads to destructive intergroup hostility and conflict.

A Novel Framework of Intergroup Competition

The current framework is partially based on the observation that there have been several construct and operational definitions of competition across different research domains and that competition can be structured in a wide variety of ways. A thorough review of the construct definitions used for competition revealed that these definitions tended to fall into one of four categories: i) situational, ii) motivational, iii) perceptual, or iv) behavioural (see Table 1 for a summary). Situational definitions emphasize that participants are placed in interdependent goal structures in which a reward is eventually distributed unevenly, based on the relative performance of participants (e.g., Deutsch, 2006; Stanne, Johnson, & Johnson, 1999). Motivational definitions describe competition in terms of an individual desire to behave competitively, prefer competitive versus individualistic or cooperative situations, or an individual's goal or need to perform better than or beat other participants performing the same or similar tasks (e.g., Johnson & Norem-Hebeisen, 1977; McClintock & Allison, 1989). Relatively few researchers outside

the domain of intergroup relations have used perceptual definitions of competition (and typically assume that competitive perceptions follow directly from appraisals of a competitively structured situation). Within the intergroup relations domain, researchers assess perceptions of zero-sum gains and losses between groups (e.g., Esses, Jackson, & Armstrong, 1998) and there is an emerging trend of studying competitive mindsets, processing styles and schemas (e.g., Golec & Federico, 2004; Sassenberg et al., 2007; see also Bar-tal, Kruglanski, & Klar, 1989). Finally, behavioural definitions describe competition in terms of the direct act(s) involved in pursuing an individual or group reward at the expense of the other individual(s) or group(s) (e.g., Deutsch, 1949, 2006; Sommer, 1995).

Table 1

Summary of Competition Construct Definitions

Situational Definitions
Negative goal interdependence: a situation in which goals are linked in such a way that the amount or probability of goal attainment is negatively correlated with the amount or probability of the other's goal attainment (Deutsch, 2006)
a process in which the comparison of an individual's performance is made with some standard in the presence of at least one other person who is aware of the criterion for comparison and can evaluate the comparison process (Martens, 1976)
a situation that involves (a) perceived scarcity, (b) an inherent uncertainty of outcome resulting from a focus on the relative performance of the particular contestants, and (c) forced social comparison (Stanne, Johnson, & Johnson, 1999)
one or more individuals carry[ing] out some actions directed toward achieving a goal by confronting another individual or group of the same species motivated by the same goal (Salvador & Costa, 2009)
Perceptual Definitions
Zero-sum beliefs: beliefs that the more the other group obtains, the less is available for one's own group ... any gains that the other group might make must be at the expense of one's own group (Esses, Jackson, & Armstrong, 1998)
Conflict schema: "Conflict-schemas are learned clusters of knowledge about intergroup situations that define (1) what situations may be regarded as conflicts, (2) when and how a conflict starts and how it should end, and (3) what the most desirable ways of dealing with conflicts are" (Golec & Federico, 2004)
Competitive conflict schema: "a model of intergroup relations that suggests that aggression is the proper way of dealing with opponents" (Golec & Federico, 2004)
Competitive mindset (Sassenberg et al., 2007): "[mindsets are] cognitive procedures related to how one chooses between various goal alternatives or to the planning of actions one must take in order to attain a chosen goal, respectively" (Gollwitzer, Heckhausen, & Steller, 1990, p. 1120)"; a competitive mindset referred to perceiving "a subsequent situation .. as more competitive (compared to when the mindset is not activated)"
Motivational Definitions
Competitive attitude: a preference for competitive over cooperative and individualistic situations (Johnson & Norem-Hebeisen, 1979)
Competitive social value orientation: A predisposition to act competitively in a situation

that allowed a choice among cooperative, competitive, and individualistic behaviours (McClintock, 1972; McClintock & Allison, 1989; Van Lange, Paul, De Cremer, Van Dijk, Van Vugt, 2007)

Hypercompetitiveness: an indiscriminate need by individuals to compete and win (and to avoid losing) at any cost as a means of maintaining or enhancing feeling of self-worth, with an attendant orientation of manipulation, aggressiveness, exploitation, and denigration of others across a myriad of situations (Dru, 2003; Ryckman, Hammer, Kaczor, & Gold, 1990)

Behavioural Definitions

Individuals acting in ways aimed at maximizing their perceived rewards and minimizing their perceived costs in relation to others (Kelley & Thibault, 1978)

Pure competition: one person attempting to outperform another in a zero-sum situation (Kelley & Thibault, 1969)

An informal attempt to outperform observable others independently performing the task (Seta, 1982; Sommer, 1995)

Oppositional interaction: individuals engaging in actions that reduce the likelihood of others' successful achievement of the joint goal (Deutsch, 1949, 2006; see also Johnson & Johnson, 2005)

It is noteworthy that different theoretical paradigms of intergroup conflict have emphasized different definitions of competition that loosely correspond to the typology illustrated in Table 1. Within the theoretical paradigm of realistic group conflict theory (RGCT), competition has been referred to as a competitive goal structure (Campbell, 1965, p. 287; Jackson, 1993, p. 397), and as actual competitive action(s) on behalf of one's group (Sherif, 1966, p. 85). Research derived from social identity theory (SIT) has primarily conceptualized competition in terms of the discriminatory or competitive action(s) on behalf of one's group (Tajfel & Turner, 1986; Turner, 1975). Individual difference variables such as social dominance orientation (SDO) and nationalism

correspond more closely to motivational definitions of competition. Finally, social interdependence theorists, and the majority of research that has examined the effects of experimentally manipulating the presence or absence of competition have emphasized situational definitions (Sommer, 1995; Stanne et al., 1999).

This current state of affairs makes it difficult to arrive at a precise understanding of the consequences of intergroup competition for a number of reasons. It is clear that the individual-level constructs of competitive motives and competitive behaviour can be distinguished from the more contextual construct of competitive situations. It is also easy to imagine circumstances in which a competitively structured situation does not elicit a competitive motivation or desire, or a competitive behavioural reaction from its participants (Gibson, Sachau, Dolle, & Shumate, 2002; Deppe & Harackiewicz, 1996; Ryckman, Thornton, & Gold, 2009). One can also imagine that heightened competitive motivation can enhance competitive behaviour and interpersonal or intergroup hostilities, even in the absence of an explicitly competitive goal structure (e.g., navigating amongst other cars on the highway). Prompting individuals or groups to engage in competitive behaviours against one another without providing a strong competitive goal structure or inducing a strong competitive motivation may also lead to interpersonal or intergroup hostility, on the basis that the participants may infer their attitudes from their behaviour (Bem, 1972; see Olson & Stone, 2005, for a review). If perceptions of the situation, competitive motives, and competitive behaviour are distinct constructs, it is also feasible that the activation of either construct may produce distinct social consequences. This implies that the effects observed from a study that manipulates competitive motivation may not generalize to a study that manipulates competitive perceptions or behaviour.

Relying on situational definitions to study intergroup competition may, therefore, provide an incomplete understanding of its social consequences. Competitive situations can be structured in an infinite number of ways, and may also include certain features that have distinct psychological meaning for participants. For example, people's reactions to competitive situations may vary depending on whether the competition occurs between individuals versus groups (Ruscher, Fiske, Miki, & van Manen, 1991; Wildschut, Pinter, Vevea, Insko, & Schopler, 2003), the presence or absence of a direct line of sight with one's competitor(s) (Drolet & Morris, 2000; see also Akimoto, Sanbonmatsu, & Ho, 2000), or a proportional versus a zero-sum, winner-take-all distribution of outcome-based rewards (Gordon, Welch, Offringa, & Katz, 2000). It is also feasible that other situational features may affect competitive behaviour and relationships among competitors, such as the degree to which formal rules and guidelines for conduct are present (Sommer, 1995), whether the competition involves physical contact among participants (Mintah, Huddleston, & Doody, 1999), or whether the competition is short-term (e.g., one temporary contest) versus long-term (a competition that consists of a series of contests).

Other factors may limit the generalizability of studies that rely on situational definitions of competition. Many instances of competition also include elements of cooperation, such as cooperating within a group against rival sports teams or corporations, or temporary alliances among individuals in a competitive tournament. In situations of intergroup conflict, there may also be elements of intragroup competition among team members who are striving for social status or distinctiveness, resulting in a complex combination of intergroup competition, and intragroup cooperation and competition. On a similar note, in any given competition, the individuals involved may

have a unique set of goals in addition to the incentive for winning the reward. It is conceivable, therefore, that participants may have mixed motives that drive competition, cooperation, or individualism (Deutsch, 2006).¹

Given the inherent drawbacks of relying on situational definitions to study intergroup competition, and the multiple conceptualizations of competition and operationalizations of intergroup competition that have been used in the literature, it is not surprising that there are a number of inconsistent findings and observations regarding its effects. An alternative to the approach of relying on competitive situational definitions to study intergroup competition would be to focus on participants' construals of the competitive events. That is, it may be more productive for researchers to examine how people ascribe meaning to competitive situations (Heine, Proulx, & Vohs, 2006). Deutsch (1949, 1962) commented that a person's perception of a potentially competitive situation influences their behaviour, rather than the objective goal structure itself. In their theory of competitive anxiety, Martens, Vealy & Burton (1995) articulated how certain competitive situations are perceived by some individuals as an interesting challenge, but by others as a threat. Multiple reviews and empirical studies have shown that subjective factors (e.g., relevance of the task or outcome to one's identity) primarily affect participants' responses to competitive events, rather than situationally objective factors (Dickerson & Kemeny, 2004; Rohleder, Beulen, Chen, Wolf, & Kirschbaum, 2007; Salvador, 2005; Salvador & Costa, 2009).

¹ Although social interdependence theorists have recognized this point, most of the research inspired by this paradigm has focused on the differences between competitive situations with no elements of cooperation ("pure" competition) and cooperative situations with no elements of competition ("pure" cooperation"; see Deutsch, 2006; Johnson & Johnson, 2005).

The current framework, therefore, departs from the approach of using situational definitions to study intergroup competition, and defines competition according to variables that illustrate how intergroup competition may be construed or experienced by its participants. That is, an individual's subjective appraisal of the potentially competitive goal structure determines whether or not the individual perceives a competitive relationship between their group and the other group(s), desires for their group to gain more or perform better than the other group(s) involved, or directly engages in activities in an attempt to secure a desired outcome for their group at the expense of the other group(s). The process(es) by which intergroup competition produces intergroup discrimination and hostility may occur via two critical variables that correspond to construct definitions of competition from the intergroup relations literature.

Competitive intergroup perceptions (CIP). A competitive intergroup perception can be conceptualized as the individual perception that one's ingroup and another group(s) in the current situation are attempting to gain a reward or desired outcome at the expense of each other. This construct corresponds to other competitive perceptual processes in the intergroup relations literature, such as the perception of realistic threat from the outgroup (Stephan, Stephan, & Gudykunst, 1999), or a competitive processing style (De Dreu & Nijstad, 2008; Sassenberg et al., 2007) or conflict schema (Golec & Federico, 2004). Competitive intergroup perceptions are also conceptually proximal with individual differences in zero-sum beliefs (Jackson & Esses, 2000; Esses, Jackson, & Armstrong, 1998), or the perception of a competitive jungle among individuals or groups (Duckitt, Wagner, du Plessis, & Birum, 2002).

Competitive intergroup motivations (CIM). A competitive intergroup motivation can be conceptualized as the individual *desire* for one's group to do better, or acquire more of a reward than the other group(s). This construct may be manifest in terms of a desire elicited by the current situation, or individual differences in a desire for competitive situations or distribution schemes between groups, or a competitive versus an individual or cooperative value orientation towards other groups. For example, individual differences in SDO can be conceptualized as the desire for an unequal distribution of rewards and status between social groups in society (Pratto et al., 1994). Of note, prior research that assessed both CIP-related processes, such as perceived competition and zero-sum beliefs, and CIM-related processes, such as SDO, revealed correlations between these variables that were positive but non-redundant, $r_s(108-174) = .41 - .61, p_s < .001$ (Jackson & Esses, 2000; Sidanius et al., 2007).

Accordingly, the current conceptual framework is based on the central idea that competitive intergroup perceptions (CIP) can be distinguished from competitive intergroup motivations (CIM). This distinction implies a number of testable hypotheses regarding the construct validity and social consequences of CIP and CIM that were examined by the current research.

Hypothesis 1 (H1). There is a positive, non-redundant relation between CIP and CIM.

It is reasonable to expect that a strong, salient CIP is also associated with a high level of CIM, given that both variables involve competitive social processes and refer to the same target group(s). It is also possible that the activation of CIP may subsequently elicit CIM, and vice versa. For example, an individual with chronically high CIM may

“see” competition in an objectively neutral, non-competitive goal structure that involves their ingroup and another outgroup. In addition, an individual who is told members of their ingroup are in competition or conflict with members of an outgroup over scarce resources may experience strong levels of CIP, which then elicit a desire for their group to acquire more resources than the outgroup (CIM). Thus, both CIP and CIM may co-occur within the same context and affect each other, resulting in a strong positive correlation. Further, experimental manipulations which increase both CIP and CIM scores may inflate the degree to which both constructs are correlated.

Because the current empirical framework conceptualizes CIP and CIM as distinct constructs, this implies that the amount of shared variance between measures of CIP and CIM, after controlling for relevant covariates and experimental manipulations, should not be so high to suggest they are redundant assessments of the same variable. Kline (2005) suggested that variables which share a correlation of .85 or above (and have 72% or more shared variance) are essentially redundant. A conservative standard for non-redundancy suggests that the majority of variance in both CIP and CIM measures should not be shared (i.e., less than 50%), which corresponds to a partial correlation of less than .70.

Hypothesis 2 (H2). CIP and CIM have unique antecedents.

As mentioned earlier, it is quite feasible that instructions of formal intergroup competition may activate a strong CIP, but may not trigger strong levels of CIM. It is also possible that the availability of desired resources or the potential of performing well on a highly self-relevant task may facilitate an increase in CIM, even in the absence of a formally competitive event. The distinction between CIP and CIM implies, therefore, that it is should be possible to manipulate both variables independently of each other. The

social consequences that follow from doing this are articulated in the final hypothesis regarding the construct validity of CIP and CIM:

Hypothesis 3 (H3). CIP and CIM have distinct influences on intergroup behaviour.

This suggests that CIP and CIM have their own unique effects, or set of social consequences that cannot be explained or subsumed by each other. For example, in a context of intergroup competition over greater economic opportunities, this suggests the perception that the other group(s) are actively positioning themselves to gain more economic resources may lead to certain feelings and behaviours that are not elicited by the motivation for the ingroup to acquire more economic resources than the other group(s), and vice versa. Alternatively, participants' CIP and CIM in this example may both have similar effects on similar sets of emotions or behaviours, but the effects of each variable may remain even after controlling for the influence of the other variable. It is also possible that CIP and CIM interact in unique ways, such that CIP may not lead an individual to experience certain emotions or engage in hostile behaviour toward outgroup members without a strong level of CIM, or vice versa. In this light, studying competition by examining the unique influences of CIP and CIM could provide many insights on the nature and outcomes of competitive intergroup processes, as it is unlikely that CIP and CIM always lead to the same outcomes or social consequences.

Perspectives on the Relations between CIP, CIM, and Discrimination

Very few studies have examined the influences of both perceptual and motivational processes in contexts of intergroup conflict or competition, and no research has specifically sought to distinguish the influence of CIP from CIM on outgroup

attitudes or behaviour. Nevertheless, there are a number of plausible perspectives by which CIP and/or CIM may lead to intergroup discrimination based on the extant findings from the intergroup relations literature.

The Independence perspective.

An independence perspective suggests that CIP and CIM are unique constructs that have unique, additive effects on intergroup discrimination. This implies that greater levels of CIP and CIM would both predict greater levels of intergroup discrimination. Experimental manipulations that increase CIP or CIM would produce additive increases of intergroup discrimination, with the expectation that the effect of one variable does not depend on the other (i.e., no interaction).

This reasoning is consistent with other research that has demonstrated that perceptual processes (e.g., perceived conflict) and motivational processes (e.g., SDO, ingroup identification) had a unique impact on outgroup attitudes and behaviour. A longitudinal study by Louis, Duck, Terry, Schuller, & Lalonde (2007) found that people's level of SDO and their perception of a diminished status advantage for Australian citizens relative to asylum seekers ("perceived structural threat") both independently predicted people's later reports of speaking out in favour of more restrictive measures against asylum seekers, and voting for more restrictive measures against asylum seekers, although Louis et al. did not report if the interaction between SDO and perceived structural threat was significant. Sidanius et al. (2007) observed that perceived group competition and SDO, but not their interaction, were significant predictors of white university students' tendency for an aggressively low resource allocation strategy toward ethnic minority student organizations. Apart from these two studies, the majority of

relevant research suggests motivational processes have a particularly strong influence on intergroup behaviour.

The Motivational perspective.

Similar to the independence perspective, a motivational perspective also suggests that CIP and CIM are unique constructs, but posits different roles for both variables in their prediction of intergroup behaviour. Specifically, a motivational perspective would suggest that motivational processes primarily influence intergroup attitudes and behaviour, rather than perceptual processes. Unlike the independence perspective, which suggests that both CIP and CIM make unique contributions in the prediction of discriminatory behaviour, the current perspective argues that CIM would be expected to predict intergroup discrimination rather than CIP.

The motivational perspective also emphasizes the primary role of CIM regarding the effects of experimental manipulations of CIP and CIM on discriminatory behaviour. According to this perspective, the only way CIP would be expected to elicit discriminatory behaviour was if CIM was also strong. This implies an interaction between CIP and CIM, such that high levels of CIP will only lead to discriminatory behaviour when CIM is also high. In contrast, the primary role of CIM in predicting discriminatory behaviour implies that a context that intensifies CIM but has no effect on CIP would still be expected to increase discriminatory behaviour.

These predictions are somewhat compatible with RGCT, which suggests a linear relation between the degree of the competitive threat and the resulting intergroup hostility (Campbell, 1965; Jackson, 1993), and SIT, which suggests that intergroup discrimination can emerge from the desire for a positive ingroup identity (Tajfel & Turner, 1986);

however, research derived from both theories has never simultaneously examined the influence of both competitive motivations and perceptions as suggested by the proposed framework. More support for these ideas is available from research on the effects of emotions on prejudice and discrimination, the SDO construct, and research that has examined perceptual and motivational processes in contexts of intergroup conflict.

Research on the relation between emotions and discrimination is relevant, considering that emotions can be conceptualized as motivational states that prepare the individual for action (Brehm, 1999; Brehm & Self, 1989; Frijda, 2004, Frijda, Kuipers, & ter Schure, 1989), and play a significant role in regulating intergroup behaviour (Maitner, Mackie, & Smith, 2006). To this end, much research has demonstrated a robust relation between certain types of emotions and intergroup prejudice (Cottrell & Neuberg, 2005; DeSteno, Dasgupta, Bartlett, & Caidric, 2004; Esses, Haddock, & Zanna, 1993) and discrimination (Cuddy et al., 2007; Esses & Dovidio, 2002; Iyer & Leach, 2006). In particular, anger, contempt, envy, frustration, and disgust have been associated with the more aggressive forms of outgroup discrimination (Cuddy et al., 2007; Mackie et al., 2000; Maitner et al., 2006). Other emotions, such as pity and admiration, have been associated with prosocial outgroup helping (Cuddy et al., 2007). Moreover, much of this research has demonstrated that perceptual processes had a weaker impact on discriminatory outgroup intentions or actions than the emotions elicited by the outgroup. A meta-analysis by Talaska, Fiske, and Chaiken (2008) found that participants' emotions, or their emotionally-based outgroup prejudice, had a stronger impact on their behavioural tendencies toward outgroups than participants' stereotypes about these outgroups (see also Mackie et al., 2000).

Research that has assessed people's level of SDO has more specific relevance to the motivational perspective, given that the SDO scale measures people's desire for an unequal dominance hierarchy among salient social groups. Prior research has shown that individuals who score relatively high on this variable were more likely to engage in intergroup discrimination (Amiot & Bourhis, 2003, 2005; Thomsen, Green, & Sidanius, 2008; Pratto & Glasford, 2008; for a recent review see Pratto, Sidanius, & Levin, 2006). In fact, high-SDO individuals are more likely to engage in, or show support for fairly aggressive forms of discrimination, such as a willingness to hunt down or persecute immigrants if laws were passed that outlawed immigration (Thomsen et al., 2008), and allocating negative, as well as a lack of positive outcomes to outgroups (Amiot & Bourhis, 2003, 2005). There are also a number of studies that demonstrate the relation between SDO and behaviours aimed at preserving the status quo for the dominant group, such as harassing women when the legitimacy of their social status was threatened (Maass, Cadinu, Guarnieri, & Grasselli, 2003), engaging in discriminatory managerial practices (Michinov, Dambrun, Guimond, & Méot, 2005), and biased jury decision-making that favoured white, but hindered black defendants (Kimmelmeier, 2005).

Research on the nature of the relation between SDO and negative outgroup attitudes and discrimination has been attributed to the competitive potential of the outgroup (Duckitt, 2006), and the outgroup's apparent threat to the status quo that favours the dominant group(s) in society (Pratto & Sidanius, 1994; Pratto et al., 2006). In line with this reasoning, Cozzolino and Snyder (2008) recently demonstrated that high-SDO participants were more likely to exert a relatively high effort to win a competition, even when doing so broke the rules.

Other research has found that competitive perceptions led to discrimination only in the presence of strong motivations that were related to the outgroup. Cuddy et al. (2007) found that stereotypes predicted intergroup behaviour, but that these relations were always mediated by participants' emotions (see also Mackie et al., 2000). Similarly, Struch & Schwartz (1989) observed that the relation between perceived conflict and outgroup aggression was strong only among those individuals who identified relatively strongly with their ingroup (see also Perreault & Bourhis, 1998, 1999).

Collectively, this research suggests that perceptions of competition with the outgroup, or perceptions of the outgroup's competitive potential, will lead to outgroup discrimination only if participants have a strong desire for superior relations relative to the outgroup, implying that intergroup discrimination may be rooted in more of a "hot" motivational, than a "cold" cognitive process. The only exception to this trend is a study by Jackson and Esses (2000, Study 2) which found that individual differences in SDO and a belief in zero-sum relations between immigrants and host populations predicted participants' (lack of) support for policies that empowered immigrants, and that zero-sum beliefs fully mediated the effect of SDO. This may have occurred because the zero-sum beliefs and empowerment measures both explicitly mentioned immigrants: that is, they were more conceptually proximal to each other than the more general items in the SDO scale, which mention relations between groups in society. Jackson and Esses also did not report whether they tested the significance of the interaction between these variables. In any case, it is clear that predictions from the motivational and independence perspectives are falsifiable and mutually exclusive.

In sum, the current research was characterized by two over-arching goals: to develop a more meaningful and accurate method of examining the influence of intergroup competition by conceptualizing and assessing it in terms of CIP and CIM, and to evaluate the independence and motivational perspectives on their predictions of when and how intergroup competition produces intergroup discrimination. This research addresses the inconsistencies in the current literature regarding the effects of intergroup competition on intergroup discrimination. Moreover, it may provide more precise insights on the role of intergroup competition in contexts of intergroup conflict.

Overview of Present Research

The objectives of the current research were twofold: i) test Hypotheses 1-3 pertaining to the distinction of competitive intergroup perceptions (CIP) and competitive intergroup motivations (CIM) that is proposed by the current conceptual framework; and ii) evaluate the independence and motivational perspectives regarding when and how intergroup competition leads to discrimination. This was accomplished in Study 1 by presenting participants with an ambiguously competitive context between an ingroup and a relevant outgroup, then assessing their self-reported CIP, CIM, and discriminatory behavioural intentions towards the outgroup. The goal of the next two studies was to experimentally manipulate CIM and/or CIP, then assess people's tendency to engage in discriminatory or prosocial behaviour toward a relevant outgroup through the use of Tajfel Matrices (Bourhis, Sachdev, & Gagnon, 1994) in a minimal-groups context (Study 2) and a natural group setting between participants' own and another comparable university (Study 3).

Study 1

The current study used a minimal-groups paradigm and presented participants with an ambiguously competitive context between the two groups, then assessed their self-reported levels of CIP, CIM, and their discriminatory and prosocial behavioural intentions toward the outgroup. In addition, the present study included other measures of relevant variables to control for their potential impact on participants' self-reported CIP, CIM, and behavioural intentions.

The current design, therefore, allowed for an initial test of Hypotheses 1 and 3, and an examination of the independence and motivational perspectives on how and why intergroup competition leads to discrimination. Following Hypothesis 1, it was expected that there would be a strong, positive correlation between CIP and CIM, but that the correlation between these variables would indicate that they are not redundant with each other. Following Hypothesis 3, it was expected that CIP and CIM would have distinct influences on participants' discriminatory and prosocial intentions toward the outgroup. The precise nature of these influences is predicted differently by the independence and motivational perspectives. The independence perspective would suggest that CIP and CIM both have significantly and independently positive and negative relations with discriminatory and prosocial intentions, respectively. In contrast, the motivational perspective would suggest that only CIM, not CIP, would primarily predict greater and weaker discriminatory and prosocial intentions, respectively, and that CIP would only predict behavioural intentions when CIM is also strong.

Method

Participants

This study sampled 130 Western University students (53 men, 75 women; $M_{\text{age}} = 18.65$, $SD_{\text{age}} = 1.47$) from the first-year introductory psychology subject pool.

Participants were compensated with one research participation credit towards their psychology course requirements².

Procedure and Materials

Participants were invited to the lab under the guise of completing a study on how people's thinking styles related to their opinions. Upon arriving at the lab, groups of up to five participants were escorted to their own private rooms or booths where they read the information letter and were introduced to the purpose of the study. The consent form and all of the predictor and criterion variable questionnaires were administered using MediaLab 2008 Research Software. The items and scales of each measure in Studies 1-3 are shown in Appendix A.

The initial portion of the study consisted of participants completing demographic questions and a series of filler individual difference measures on people's personality, values, commitment to beliefs, and social desirability that were ostensibly included to investigate the relation between personality and thinking style. The 16-item Social Dominance Orientation scale (SDO; Pratto et al., 1994) was also included to assess participants' preference for unequal or dominant and subordinate relations among salient social groups (Pratto, Sidanius, & Levin, 2006). In line with the current framework, the SDO scale was included as a proxy measure of participants' chronic differences in

² This study was conducted as part of an honours thesis project that was supervised by the first author and investigated how CIP and CIM related to intragroup cohesion and intergroup distinctiveness, alongside discriminatory outgroup intentions.

competitive intergroup motivation³. For all continuous multi-item measures in Studies 1-3, mean scores were formed by averaging their respective items, and high scores indicated greater levels of that variable.

The second part of the study was designed to mislead participants to think they were completing a computer-based task that could determine their thinking style as either an inductive or a deductive thinker. To make this task appear to be a credible assessment of thinking style, the program administered the Dialectical Thinking Questionnaire (Spencer-Rodgers, Srivastava, & Peng, 2001), which includes items that could feasibly assess people's critical thinking strategies (see Appendix A), then asked participants to interpret eleven ambiguous pictures (see Appendix B for sample items). These pictures taken from various websites, online test databanks and games in which people report their interpretations of ambiguous pictures. Care was taken so that the selected pictures were not presented within the course material for first-year psychology participants at Western University, and on the whole, would be unfamiliar to most people. Once participants had completed all the questions, the program displayed two sequential loading screens (e.g., "Accessing the database...", "Analyzing participant responses..."), followed by a results screen that classified all participants as a deductive thinker.

When the assessment task had been completed, the participant summoned the experimenter for the next stage of the study. The experimenter recorded the results of the participant's thinking style on a checklist, then gave the participant a mock research summary article to read (see Appendix C) with a reminder-slip indicating their assigned

³ We created and administered an eight-item scale to assess and potentially control for participants' perceptions of active competition between salient social groups in society, similar to the use of SDO as a proxy for individual differences in competitive intergroup motivation. In Studies 1-3 this measure was never correlated with self-reported CIP or CIM and demonstrated inconsistent relations with all other criterion and covariate measures, and is therefore not reported.

thinking style as a deductive thinker. The article was framed as a newsletter article produced by the Canadian Psychological Association which ostensibly summarized current research on inductive (outgroup) and deductive (ingroup) thinking styles. The article was expected to vary participants' social identification with their deductive thinking ingroup by discussing research findings on the apparent differences between the two thinking style groups (e.g., "...research has found a tendency for inductive thinkers to enjoy bike rides and film editing, whereas deductive thinkers preferred hiking and photography..."). The article was also designed to induce variation in participants' level of CIP and CIM by presenting an ambiguously competitive context between deductive and inductive thinkers (e.g., "Some studies show that inductive thinkers perform better than deductive thinkers, whereas some studies show that the performance level is higher for deductive than inductive thinkers."). The article also presented some indications of intragroup similarity and intergroup differences to enhance the relevance of the discriminatory and prosocial criterion variables (e.g., "Thompson and Mummendey (2007) have found that, within their own groups, inductive thinkers tend to have fairly similar lifestyles, beliefs, and values as other inductive thinkers, and likewise for deductive thinkers..." "Other research has shown that inductive and deductive thinkers have, at times, differed in terms of their voting preferences as well,").

Comprehension check. After participants read the article, the experimenter loaded a survey file that contained a comprehension check of the article followed by all of the dependent variables. The comprehension check asked participants to indicate whether they were identified as a Deductive or Inductive thinker, whether researchers were currently investigating whether deductive or inductive thinkers performed better on

measures of performance and social adjustment, and whether the current research indicated there was a 50/50 chance that deductive or inductive thinkers would generally perform better on performance measures.

Predictor variables. Directly following the comprehension check, participants completed measures of CIM and CIP. Participants also completed a measure of ingroup identification as a potential covariate (see Appendix A). The presentation order of these measures and scale items were randomized to minimize any order effects.

CIP and CIM. Competitive intergroup perceptions (CIP) were assessed using a 4-item scale designed to investigate the individual's appraisals of the relationship between Inductive and Deductive thinkers as either competition or non-competitive. Competitive intergroup motivations (CIM) were assessed using a 6-item scale designed to investigate the participant's desire for deductive thinkers to out-perform and maintain superiority over other inductive thinkers.

Ingroup identification. To assess their level of ingroup identification, participants completed an 8-item measure assessing the degree to which they identified their ingroup and considered that their membership with the ingroup as an integral part of their identity. This measure was adapted from previous research on social identification (see Ellemers, Kortekaas, & Ouwerkerk, 1999; and Leach et al., 2008).

Criterion variables. After the predictor measures were complete, the computer administered criterion measures of participants' intentions to engage in discriminatory and prosocial behaviours toward the outgroup. The items from these measures were adapted from scales used in previous research examining the relations between group identification and/or SDO and various group identity management strategies (e.g.,

outgroup prejudice or discrimination, ingroup mobilization, outgroup acquiescence; Mummendey, Klink & Brown, 2001; Struch & Schwartz, 1989; Thomsen, Green, & Sidanius, 2008).

Following the criterion measures, the experimenter completed a funnel debriefing procedure to assess whether participants suspected the group context and materials were fictional. Under the guise of verifying the effectiveness of the instructions, the experimenter asked participants to discuss their thoughts on the purpose of the study, the accuracy of their thinking style assessment results and the mock research summary article. Participants were then provided with a debriefing form and formally debriefed.

Results

Data Preparation

In the total sample of 130 participants, 14 individuals thought the thinking style program was fictional and their data were excluded from the analyses. Of the final sample of the remaining participants ($n = 116$, 47 men, 69 women; $M_{\text{age}} = 18.56$, $SD_{\text{age}} = .88$), 100% correctly identified themselves as a deductive thinker, and 96% or more correctly stated that the researchers were investigating whether deductive or inductive thinkers perform better of measures of performance, and that there is a 50/50 chance of deductive or inductive thinkers performing better on any given performance measure. Thus, virtually everyone in the final sample correctly understood and believed the group context.

Participants' mean scores on the individual difference, predictor, and criterion variables are presented in Table 2. Each of these variables demonstrated good psychometric properties in terms of their range, skew, and internal consistency. In

addition, each of the variable means were significantly above the scale minimum, $t_s(115) > 16.34$, $p_s < .001$, and below the scale maximum, $t_s(115) < -18.35$, $p_s < .001$. These data suggest that potential floor or ceiling effects were not likely to have affected the reliability of the variables or their relations in the present study, and in particular, that participants reported a range of CIP and CIM scores and intentions toward the outgroup.

Table 2

Psychometric Properties of Variables in Study 1

Measure	<i>n</i>	<i>M</i>	<i>SD</i>	α	Potential range	Actual range	Skew
SDO	116	2.48	.91	.90	1.0-7.0	1.0-5.7	.78
ID	116	3.85	.91	.85	1.0-7.0	1.4-5.3	-.68
CIP	116	2.78	1.29	.87	1.0-7.0	1.0-6.3	.42
CIM	116	2.72	1.32	.90	1.0-7.0	1.0-6.0	-.34
Discriminatory intentions	116	2.53	1.66	.72	1.0-10.0	1.0-7.5	.87
Prosocial intentions	116	6.58	2.01	.90	1.0-10.0	1.0-10.0	-.54

Note. SDO = Social Dominance Orientation. ID = Ingroup identification. CIP = Competitive intergroup perceptions. CIM = Competitive intergroup motivations.

Covariate Analyses. The first stage of the analyses consisted of determining which variables would be suitable as covariates. The overall goal of this stage was to identify covariates that would increase the sensitivity of the primary hypothesis tests while also omitting variables that accounted for little to no unique variance and whose inclusion would decrease degrees of freedom and statistical power.

People's sex and level of SDO and ingroup identification have been related to greater levels of discriminatory behaviour (Pratto, Sidanius, & Levin, 2006; Tajfel & Turner, 1986; Van Vugt, De Cremer, & Janssen, 2007), therefore, the present study collected data on these variables to potentially control for their influence on discriminatory and prosocial intentions. With regard to ingroup identification, the predictions of and prior research on Social Identity Theory (e.g., Ellemers, Kortekaas, & Ouwerkerk, 1999; Jetten, Spears, Hogg, & Manstead, 2000; Tajfel & Turner) suggest ingroup identification will be associated with greater levels of discriminatory behaviour, although this has not always proven to be the case (see reviews by Brown, 2000; Hewstone, Rubin, & Willis, 2002). Social dominance theory discusses the relations between high and low hierarchical intergroup status and discrimination, but it does not make clear predictions about the influence of SDO in a context similar to the present study in which it is ambiguous as to whether there is a competition between two arbitrary, equal-status groups. These variables, therefore, were only to be included as covariates in the final analyses if they were related to at least one of the criterion measures of discriminatory and prosocial outgroup intentions. As seen in Table 3, SDO and ingroup identification were related to CIP, CIM, and discriminatory outgroup intentions. A one-way (Sex [female, male]) multivariate analysis of variance (MANOVA) on the predictor and criterion variables with SDO and ingroup identification as covariates revealed no multivariate or univariate main effect of sex, $F_s < 1.5$, suggesting that sex did not contribute any unique variance to any of the predictor or criterion variables over and above SDO and ingroup identification. The primary analyses, therefore, included only SDO and ingroup identification as covariates in all hypothesis tests below.

Table 3

Zero-order Correlations among Individual Difference, Predictor, and Criterion

Variables in Study 1

	1	2	3	4	5	6
1. SDO	—					
2. ID	.07	—				
3. CIP	.16 [†]	.27**	—			
4. CIM	.30**	.23*	.65***	—		
5. Discriminatory intentions	.33***	.33***	.41***	.57***	—	
6. Prosocial intentions	-.15	.00	-.03	-.21*	-.03	—

Note. SDO = Social Dominance Orientation. ID = Ingroup identification. CIP = Competitive intergroup perceptions. CIM = Competitive intergroup motivations. [†] $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis tests

H1: There is a positive, non-redundant relation between CIP and CIM. As seen in Table 1, CIP and CIM shared a strong, positive correlation, $r(114) = .65, p < .001$. A partial correlation that controlled for SDO and ID also revealed a strong positive correlation between CIP and CIM, $r(112) = .62, p < .001$. This indicates that both measures shared 38% of their variance, which is substantially less than the conservative standard of redundancy that suggests less than 50% of the variance between these measures should be shared. Thus, H1 was supported.

H3: CIP and CIM have distinct influences on intergroup behaviour. To examine the unique influences of CIP and CIM on the criterion variables, separate

regression analyses on discriminatory and prosocial outgroup intentions included SDO and ID as covariates in the initial block, then CIP and CIM as predictors in the final block. Table 4 compares the contextual influences of ingroup identification, CIP, and CIM on discriminatory and prosocial outgroup intentions according to their observed zero-order correlations and standardized regression weights. The regression analyses revealed that CIM was associated with greater levels of discriminatory outgroup intentions and lower levels of prosocial outgroup intentions, as expected. The standardized regression weights also show that CIM was also more strongly related to discriminatory and prosocial intentions than ID and CIP, and that the effect of CIP was not significant when ID and CIM were included⁴. These effects are noteworthy, considering that the zero-order correlations suggested ID, CIP, and CIM were all positively related to discriminatory intentions. These results generally support the motivational perspective, as CIM rather than CIP was related to discriminatory and prosocial outgroup intentions in the expected directions.

⁴ In the analysis of discriminatory intentions, the effects of SDO and ID were both significant and positive, $\beta_s = .18 - .20, ps < .03$. In the analysis of prosocial intentions, the effects of SDO and ID were both not significant, $ps > .1$. When the SDO and ID covariates were excluded from the analyses of discriminatory and prosocial intentions, the regression results illustrating the significant effect of CIM and the non-significant effect of CIP on discriminatory and prosocial intentions were unaffected.

Table 4

Prediction of Discriminatory and Prosocial Outgroup Intentions in Study 1

	ID		CIP		CIM		R ²
	<i>r</i>	β	<i>r</i>	β	<i>r</i>	β	
Discriminatory intentions	.33***	.20*	.41***	.04	.57***	.44***	.39
Prosocial intentions	.00	.03	-.03	.17	-.21*	-.30*	.07

Note. SDO = Social dominance orientation. ID = Ingroup identification. CIP = Competitive intergroup perceptions. CIM = Competitive intergroup motivations. β = standardized beta weights. Standardized beta weights are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$

The motivational perspective further suggests that CIP will lead to intergroup discrimination only if CIM is also strong, suggesting a significant interaction between CIP and CIM predicting outgroup intentions. This idea was tested according to the guidelines recommended by Aiken and West (1991) for conducting hierarchical regression analyses that test for two-way interactions between continuous variables. After centering participants' CIP and CIM scores, each regression analysis included SDO and ID as covariates in the first block, centered CIP and CIM in the second block, and the computed interaction term between CIP and CIM in the final block. The interaction between CIP and CIM was marginally significant in the prediction of discriminatory intentions, $\beta = .14$, $p = .075$, $R^2 = .41$, $\Delta R^2 = .02$,⁵ but it was not significant in the prediction of prosocial outgroup intentions, $\beta = .08$, $p > .1$, $R^2 = .08$, $\Delta R^2 = .01$.

⁵ In the final step, the effects of SDO and ID were both significant and positive, β s = .18 - .21, $ps < .03$. When the covariates were not included, the interaction between CIP and CIM was not significant, $\beta = .13$, p

If CIP leads to greater discriminatory intentions when CIM was strong, this implies a significant positive effect of CIP on discriminatory intentions only at high levels of CIM. In contrast, the analyses of simple slopes revealed that the effect of CIP was not significant at relatively low and high levels of CIM. Instead, the simple slope analyses revealed that the effect of CIM on discriminatory intentions was significant at low levels of CIP, $b = .36, p = .029$, and this effect was stronger at high levels of CIP, $b = .66, p < .001$. This result is displayed in Figure 1.

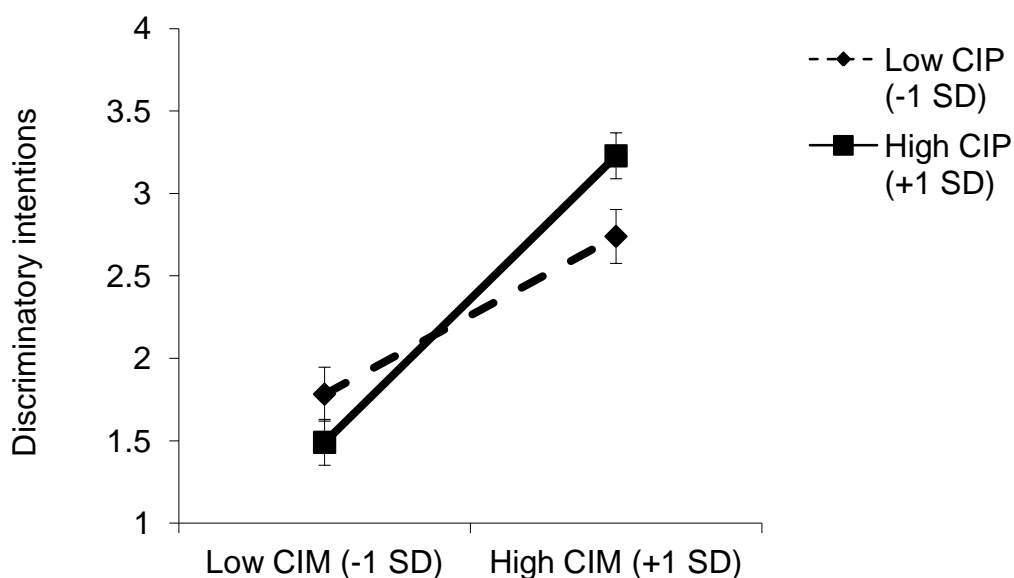


Figure 1. Discriminatory intentions as a function of CIM and CIP, Study 1.

Discussion

The present study was designed to test the idea that CIM and CIP are related, but distinct variables that are likely to have unique effects on intergroup discrimination. In

> .1, $R^2 = .34$. Given that SDO and ID were both related to discriminatory intentions, it is likely that the analysis was not sufficiently sensitive to detect this effect.

line with this idea, CIM and CIP were strongly related, and the regression results revealed that CIM, but not CIP, was related to discriminatory and prosocial outgroup intentions.

With regard to understanding how and when intergroup competition affects outgroup intentions, the current results did not support the independence perspective. That is, the current results clearly did not support the idea that CIP and CIM both had unique, independent effects on outgroup intentions as predicted by the independence perspective. Although the zero-order correlations suggested CIP and CIM were both related to discriminatory intentions, the regression results illustrated that CIM clearly had a primary role in predicting both discriminatory and prosocial intentions. This has implications for those studies that only assess how the perceptions of intergroup competition relate to intergroup prejudice and discrimination without also assessing the motivation to compete on behalf of one's group (e.g., Stephan et al., 2005). The present study showed that CIM, not CIP, predicted stronger intentions to discriminate against and weaker intentions to engage in prosocial behaviour towards the outgroup, which is consistent with the motivational perspective. However, the interaction between CIP and CIM predicted by the motivational perspective, such that CIP would lead to negative outgroup behaviour only when CIM was strong, was not completely supported by the data. The interaction between CIP and CIM did not predict prosocial intentions, and was marginally significant in the prediction of discriminatory intentions. Further, this interaction suggested that CIP had no affect on discriminatory intentions regardless of CIM; rather, CIP appeared to amplify the effect of CIM on discriminatory intentions. In sum, the results provided mixed support for the motivational perspective.

On the whole, the present study generally supported the value of distinguishing competitive intergroup perceptions from motivations when assessing the impact of competition on intergroup discrimination, and the idea that CIM has a particularly important role in the prediction of intergroup discrimination. If CIP and CIM are distinct constructs that have unique effects on intergroup behaviour, it should be possible to manipulate one construct while keeping the other constant, and the effect(s) of activating one construct should be manifest even in the absence of the other. Thus, if CIM, but not CIP, is primarily responsible for eliciting intergroup discrimination, it should be possible to experimentally increase levels of self-reported CIM while keeping CIP low, and observe that the increase in CIM is associated with greater intergroup discrimination, as predicted by the motivational perspective. This idea was tested in Study 2.

Study 2

The goal of Study 2 was to conduct a stronger test of the distinctiveness of CIP and CIM as proposed by the current conceptual framework, and the corollary from the motivational perspective that CIM can foment intergroup discrimination even when CIP levels are low. The present study was designed, therefore, to manipulate CIM while keeping CIP levels relatively low, and assess the impact of changes in CIM on intergroup discriminatory behaviour.

Study 2 presented participants with the same minimal-groups context from Study 1 with the additional information that they would be completing a group performance task at the end of their session. Participants were also told that they would be completing a group decision-making exercise that involved allocating points which counted as questions answered correctly on the performance task to random selections of ingroup

and outgroup members; this task served as the primary measure of discriminatory and prosocial behaviour toward the outgroup. To maintain relatively low levels of CIP, all of the participants in this study were told that there is no competition between groups on the performance task. To manipulate CIM, participants were randomly assigned to see one of two descriptions of the group performance task that varied the degree to which it would be intrinsically motivating for one's group to achieve a high score on this task. This was done by describing the performance task as a measure of perceptual skills that was unrelated to academic aptitude, or as a measure of academic skills that was diagnostic of academic aptitude. Thus, the present study was designed to manipulate CIM levels by varying the construal of the group performance task, such that strong performance would indicate neutral versus high levels of academic aptitude, respectively⁶. Following this manipulation, the present study assessed participants' self-reported CIP, CIM, and their point allocation decisions.

Following Hypothesis 1, it was expected that CIP and CIM would be positively, but not redundantly correlated with each other. Based on the idea that both constructs have unique antecedents (Hypothesis 2), it was expected that the assertion of no competition between the groups would result in relatively low levels of CIP across all participants; however, the manipulation of the intrinsic value of strong performance on

⁶ The academic incentives for competitive motivation were based on the results from Study 2 of Maxwell-Smith & Seligman (2011). Two of the questions in this study presented a list of 22 potential incentives and asked participants to indicate the degree to which each incentive would lead them to voluntarily compete with others to obtain it if such an opportunity was made available (0 = *Not at all*; 10 = *Absolutely*), and the degree to which each incentive would lead them to want to perform well in a competition if it was the prize for winning (0 = *Not at all*; 10 = *Absolutely*). The majority of participants ($N = 174$) rated the "good performance on a test of intellectual ability" incentive within the top 5 as most likely to lead them to voluntarily compete with others ($M = 8.31$) and want to perform well in a competition if it was the prize for winning ($M = 8.61$), and these results did not differ by sex, $ts < .1$. It was not feasible to base Studies 2 and 3 on the other incentives that participants identified as having higher importance than performing well on an intelligence test (e.g., "getting a hard-to-obtain job," "representing your family positively,"). Other material incentives (e.g., "gift certificates," "winning \$20,") garnered lower ratings ($Ms = 5.41 - 6.69$).

the performance task would result in participants who are told the task is assessing academic skills reporting greater levels of CIM than participants who are told the task is assessing perceptual skills. Finally, following Hypothesis 3 and the motivational perspective, it was expected that CIM would be more strongly related to (greater) discriminatory and (less) prosocial behaviour than CIP, and that the observed increase in CIM following the academic aptitude construal manipulation would result in more discriminatory behaviour and less prosocial behaviour toward the outgroup.

Method

Participants

Participants were 112 Western University students (38 men, 73 women, 1 unreported; $M_{\text{age}} = 18.16$, $SD_{\text{age}} = .87$) from the first-year introductory psychology subject pool who participated for course credit.

Procedure & Materials

Participants were invited to the lab in groups of up to six individuals under the guise of completing a study on how people's thinking styles related to their opinions, personality, decision-making tendencies, and performance. Thus, participants were presented with the same materials used in Study 1 with a number of exceptions.

All participants were told that each session consisted of six individuals and that they would be asked to complete a performance task at the end of their session. The thinking style assessment program which told everyone they were a Deductive thinker was completed first. At this stage, the participant was asked to summon the experimenter, and if the current session consisted of less than six individuals, the experimenter was trained to convey their relief at the apparent fact that each of the six individuals who were

originally scheduled to appear had arrived a few minutes late and were set up in a different room. The experimenter then gave participants the same fictional research article portraying an ambiguously competitive context between inductive and deductive thinkers used in Study 1. Upon reading the article and completing the comprehension check, the experimenter loaded the program file that administered the academic aptitude construal manipulation, all of the criterion variables, and a selection of demographic and personality questionnaires that was similar to Study 1. The program then told participants to find the experimenter, who then completed a funnel debriefing procedure similar to Study 1.

Experimental manipulation. At this stage of the study, the program presented participants with further details on the nature of the performance task that they were to complete at the end of the session. All participants were told that the performance task consisted of answering a series of questions administered in a variety of formats (e.g., multiple-choice, true/false, etc) over the course of approximately 10 minutes, with unanswered questions counting as incorrect responses. In addition, the program told all participants that the task was configured as a group performance task, such that each individual in a given session was answering questions on behalf of their thinking style group, and that the amount of questions answered correctly and incorrectly would count toward the group performance score. The program also encouraged participants not to rush their responses, as the group performance score was to be calculated as the proportion of questions answered correctly by the members of each thinking style group in each session.

At this stage, participants were randomly assigned to one of two conditions that presented different information regarding the nature of the performance task. In the neutral academic aptitude condition, the program told participants the performance task was a measure of perceptual and reflexive performance that was unrelated to academic achievement:

“[PAGE 1:] The performance task you will complete today measures people's PERCEPTUAL AND REFLEXIVE PERFORMANCE. More specifically, this task presents questions drawn from sources that have been used in assessing people's visual acuity and response time. Accordingly, research has also shown that people's performance on this task is completely UNRELATED to other areas such as academic achievement and intelligence. This finding has been proven by several studies.

[PAGE 2:] To summarize, the performance task that you will complete today asks everyone to correctly answer as many questions as they can as members of their thinking style group.

Also, remember that this task is a measure of perceptual/reflexive performance: people who score highly on this task are no more or less likely to perform well or poorly in other areas such as intelligence and academic achievement.”

In the high academic aptitude condition, the program told participants the performance task was a measure of academic performance that was strongly related to academic achievement:

“[PAGE 1:] The performance task you will complete today measures people's ACADEMIC PERFORMANCE. More specifically, this task presents questions drawn from sources that have been used in assessing people's intelligence and scholastic aptitude. Accordingly, research has also shown that people who perform well on this task also tend to perform VERY WELL in other areas such as academic achievement and intelligence. This finding has been proven by several studies.

[PAGE 2:] To summarize, the performance task that you will complete today asks everyone to correctly answer as many questions as they can as members of their thinking style group.

Also, remember that this task is a measure of academic performance: people who score highly on this task are more likely to perform well in other areas such as intelligence and academic achievement.”

Comprehension Questions. Following the experimental manipulation, the program administered a series of questions about the participants’ session and performance task to verify their understanding of the context and the experimental manipulation. Each question was administered in a true/false format, and to ensure that participants correctly understood the context of the present study, they were given feedback as to whether they answered correctly or incorrectly. If a participant answered incorrectly, the program explained why the answer was incorrect, and gave the participant another opportunity to give a correct answer to the question.

The first question asked if group performance is calculated by averaging the scores from each individual group member in the upcoming performance task (correct answer: true). The second question asked if the researchers of this study set up the performance task to be a competition between Deductive and Inductive thinkers (correct answer: false). The goal of this question was to reinforce that the current task was not organized as a competition between inductive and deductive thinkers and keep the level of CIP relatively low across the study. The next three questions asked whether the performance task was a measure of perceptual or reflexive skills, intelligence or academic aptitude, and whether research has shown people who performed well on the performance task are more likely to perform well in areas such as academic achievement and intellectual performance, and the feedback on participants’ answers corresponded to their assigned condition.

Predictor Measures & Contextual Covariates. Following the comprehension questions the program administered a series of questionnaires that were similar to the predictor and covariate questions administered in Study 1 with a few exceptions. The CIP and CIM measures were adapted from those used in Study 1 for the current context, and reduced to a total of 3 items each to reduce participant fatigue and suspicion of the cover story. The present study included two questions to assess the appeal of performing well on the performance task which were designed to assess the effectiveness of the academic aptitude construal manipulation, such that participants were expected to report a greater incentive appeal when the task was presented as a measure of primarily academic rather than perceptual performance. This study also included a single-item measure of perceived difficulty and a two-item measure of anticipated interest in the performance task to rule out, or control for their potential influence of on participants' self-reported level of CIP, CIM, or their discriminatory behaviour toward the outgroup. The items for these measures and their scales are shown in Appendix A. For measures with more than one item, mean scores were formed by averaging all of the items for that scale, with higher scores indicating greater levels of that variable.

Criterion Variables. The present study assessed discriminatory and prosocial behaviour toward the outgroup through the use of Tajfel matrices, which involve assigning points—typically representative of resources—to ingroup and outgroup members, and have been used in minimal-group paradigm studies that have examined intergroup discrimination (e.g., Amiot & Bourhis, 2005; Scheepers et al., 2006a, Turner, Brown, & Tajfel, 1979).

Tajfel matrices. At this stage, the program first explained that it would present participants with a series of trials in which they would award points to a random selection of one ingroup (deductive thinkers) and outgroup member (inductive thinkers), but never themselves personally. The program explained that the points in this exercise counted as questions answered correctly on the performance task that everyone would be completing at the end of their session. Participants allocated points by choosing one column of numbers from a table presented in the center of the screen, with the numbers in the top row representing points that would be allocated to a person in one group, and the numbers in the bottom row representing points that would be allocated to the other group. Thus, the points each participant accumulated could influence their group score on the performance task in addition to the number of questions each group member answered correctly or incorrectly. The program presented six pages of instructions that thoroughly explained the operation of the Tajfel matrix tables, and that assigning points in this exercise was equivalent to giving ingroup and outgroup members a greater score on the performance task at the end of their session (see Appendix D for the full set of Tajfel matrix instructions used in Study 2 and adapted for Study 3).

Tajfel matrices provided a way for participants to use different strategies in the manner that they allocate points to ingroup and outgroup members. As seen in Appendix E, participants could allocate equal points to both group members, or give more points to ingroup or outgroup members. On this basis, researchers have assessed the degree to which participants follow four primary strategies (Bourhis et al., 1994; Tajfel & Turner, 1986): maximum joint profit (MJP), a strategy to maximize resources for both ingroup and outgroup members; parity (P), a strategy to allocate equal resources to ingroup and

outgroup members; maximum ingroup profit (MIP), a strategy to award the maximum amount of resources to the ingroup regardless of how much is awarded to the outgroup; and maximum difference (MD), a strategy to maximize a favourable difference for ingroup over outgroup members even if doing so comes at the cost of absolute ingroup profit. Researchers have also presented matrices that assess ingroup favouritism (FAV), which is an amalgamation of the MIP and MD strategies (see Matrices 3-6 in Appendix E).

Across all matrices, the primary use of a strategy corresponds to one column selection at one end of the table. Researchers have typically presented pairs of matrices in which one table pits the use of one strategy versus another (e.g., pitting the MD against the MJP + MIP strategies in Matrix 1), and the other table assesses the tendency to use both strategies (e.g., assessing the use of MD together with MIP and MJP in Matrix 2). This provides an assessment of the difference between the tendency to use a particular strategy in isolation (e.g., MD in Matrix 1) versus the tendency to use it in combination with the other strategies it is pitted against (e.g., MD together with MIP and MJP in Matrix 2). The calculation of “pull scores” is based on this logic, and they allow researchers to assess participants’ primary use of a particular strategy versus its alternate. Each pair of Tajfel Matrices therefore generated two corresponding pull scores that assess the primary use of one of the two available strategies (e.g., Matrices 1 and 2 generate pull scores for MD vs. MJP + MIP, and MJP + MIP vs. MD), and these scores are typically related but mathematically independent from each other (Bourhis et al., 1994).

The present study presented the six matrices in Appendix E and varied whether the ingroup or outgroup member appeared on the top row of each matrix, resulting in

twelve matrices total. Thus, the present study generated six pull scores that corresponded to the point allocation tendencies of MD vs. MJP + MIP (choosing maximum intergroup difference vs. maximum ingroup profit), MJP + MIP vs. MD (choosing maximum ingroup profit vs. maximum intergroup difference), P vs. FAV (choosing equality vs. ingroup favouritism), FAV vs. P (choosing ingroup favouritism vs. equality), FAV vs. MJP (choosing ingroup favouritism vs. maximum joint gain), and MJP vs. FAV (choosing maximum joint gain vs. ingroup favouritism). Each pull score had a potential range of -12 to 12, with higher scores reflecting a stronger tendency toward the primary strategy. Because the current research is focused on prosocial and discriminatory intergroup behaviour, the MJP vs. FAV and MJP + MIP vs. MD strategies were not of primary interest and are not reported.

Coded strategy mention. Directly following the Tajfel matrices, the program asked participants to provide an open-text response to the following questions: “Please think about your point distribution decisions in the previous exercise, and describe for us below how you generally arrived at your decisions. What were the major reasons for choosing the options that you chose? Did you consistently rely on one or more guidelines across all of your decisions, or did you analyze decide on each independently from the next?” Two independent coders who were blind to the hypotheses and experimental conditions rated each response using a coding scheme that was based, in part, on a similar method developed by Cohen, Montoya, and Insko (2006, Study 2) to analyze the reasons for participants’ choices in a study that involved point allocations within a prisoner’s dilemma context. The current coding scheme evaluated participants’ responses according to five dimensions: i) Ingroup Max (maximizing the ingroup’s outcomes); ii) Outgroup

Min (ensuring the outgroup received as few points as possible/maximizing the difference between the ingroup and outgroup), iii) Relative (ensuring that the ingroup received more points than the outgroup); iv) Equality (ensuring that the ingroup and outgroup received equal an amount of points); and v) Maxjoint (giving the maximum amount of points to both individuals in each trial, regardless of their group membership). The latter strategy was analyzed but is not of primary interest and is not reported. Each response on all coding dimensions was rated on a three-point scale (-1 = *mentioned and intentionally avoided the strategy*; 0 = *did not mention the strategy*; 1 = *mentioned and applied the strategy*), and it was possible for participants' responses to be classified into more than one dimension. After coding 10% of the responses, raters met with each other and the first author to clarify and resolve any discrepancies. The mean interrater agreement across all dimensions for all of the responses was high, $r(100-101) = .80, p < .001$, with the coder intercorrelations ranging from .74 to .84 across all dimensions.

Individual Difference Measures. Following this question, the program administered the final section consisting of demographic and individual difference measures. This section administered the same measure of ingroup identification from Study 1. It also administered the shortened 10-item SDO scale (Schmitt, Branscombe, & Kappen, 2003; see Appendix A) in place of the longer measure used in Study 1 to minimize time and fatigue. The present study also included a four-item measure of hypercompetitiveness (Dru, 2003; see Appendix A) designed to assess and potentially control for people's individual tendency to act competitively in general. To support the cover story of the study, these questionnaires were interspersed with measures of political and economic system-justification (Kay & Jost, 2003; Jost & Thompson, 2000), belief in

a just world (Lipkus, 1991), and commitment to beliefs (Maxwell-Smith & Esses, 2012). To reduce participants' suspicion of the cover story, one of the latter scales preceded each individual difference measure that was more directly related to the current context (i.e., the hypercompetitiveness, SDO, and ingroup identification measures).

Results

Data Preparation

The final sample of 104 participants (35 men, 69 women; $M_{\text{age}} = 18.14$, $SD_{\text{age}} = .88$) for the analyses excluded 8 individuals from the total sample who thought the thinking style program was fictional. Of the final sample, 97% or more correctly identified themselves as a deductive thinker, and stated that the researchers were investigating whether deductive or inductive thinkers perform better on measures of performance, and that there is a 50/50 chance of deductive or inductive thinkers performing better on any given performance measure. In response to the remaining comprehension questions regarding the instructions for the performance task, 98% or more participants from the final sample gave correct responses, or they changed an initially incorrect answer to the correct response in its corresponding follow-up question. Thus, virtually everyone in the final sample correctly understood and believed the group context and the instructions regarding the performance task in their assigned condition.

The final sample of participants' mean scores on the individual difference, predictor, and criterion variables are presented in Table 5. One of the present study's objectives was to maintain low levels of CIP while experimentally manipulating CIM. Table 5 shows that participants reported a wide range of scores for CIP and CIM, and the means of both variables were significantly above the scale minimum, $t_s(106) > 14.00$, ps

< .001. It is noteworthy, therefore, that a paired-samples t-test revealed that across all participants, self-reported CIM was higher than self-reported CIP, $t(106) = 6.05, p < .001$, and that the variable mean was lower than the scale midpoint for CIP, $t(106) = -4.82, p < .001$, but not CIM, $t(106) = .55, p > .1$. These data suggest that CIP was relatively lower than CIM across all participants in Study 2, as expected.

Table 5

Psychometric Properties of Variables in Study 2

Measure	<i>n</i>	<i>M</i>	<i>SD</i>	α	Potential range	Actual range	Skew
SDO	103	2.73	1.27	.92	1.0-7.0	1.0-7.0	.46
Hypercompetitiveness	103	5.22	.96	.71	1.0-7.0	2.0-7.0	-.50
ID	103	4.08	.82	.81	1.0-7.0	1.6-6.5	-.07
Perceived interest	104	4.89	.99	.90	1.0-7.0	3.5-7.0	.70
Perceived difficulty	104	3.94	1.18	—	1.0-7.0	1.0-7.0	-.64
Incentive appeal	104	5.35	1.22	.69	1.0-7.0	1.0-7.0	-.85
CIP	104	3.23	1.60	.81	1.0-7.0	1.0-7.0	.48
CIM	104	4.08	1.53	.83	1.0-7.0	1.0-7.0	-.27
Total points to ingroup	104	193.84	31.27	—	72.0-264.0	112.0-252.0	.25
Total points to outgroup	104	145.86	28.46	—	96.0-240.0	92.0-216.0	-.46
Difference in points to ingroup vs.	104	47.99	56.06	—	-168.0-168.0	-40.0-144.0	.50

outgroup							
MD vs. MJP+MIP	104	3.91	4.91	—	-12.0-12.0	-3.0-12.0	.57
FAV vs. P	104	4.22	5.08	—	-12.0-12.0	-3.5-12.0	.56
FAV vs. MJP	104	1.93	3.16	—	-12.0-12.0	-8.0-12.0	.22
P vs. FAV	104	5.71	5.46	—	-12.0-12.0	-6.0-12.0	-.17
Ingroup Max	103	.26	.44	—	-1.0-1.0	0.0-1.0	1.10
Outgroup Min	103	.15	.49	—	-1.0-1.0	-1.0-1.0	.32
Relative	103	.43	.57	—	-1.0-1.0	-1.0-1.0	-.35
Equality	102	.57	.50	—	-1.0-1.0	0.0-1.0	-.28
Discriminatory behaviour	104	.01	.80	.88	-2.6-2.6	-1.1-1.5	.61
Prosocial behaviour	104	-.01	.86	.62	-2.6-2.6	-1.7-1.0	-.15

Data reduction of criterion variables. One set of criterion measures from the Tajfel matrix procedure is the total amount of points given to ingroup and outgroup members across all trials, as well as the magnitude of the point allocation difference between ingroup and outgroup members (e.g., Jetten, McAuliffe, Hornsey, & Hogg, 2006; Leonardelli & Brewer, 2001). For parsimony and consistency with Study 1, the remaining Tajfel matrix and coded strategy criterion variables were examined according to their conceptual correspondence to discriminatory and prosocial outgroup behaviour.

The P vs. FAV and coded Equality strategies represent the choice to allocate points evenly to both groups when given the opportunity to allocate points in favour of

one's group, and they were both positively and strongly related (see Table 6). The remaining variables generally represent the tendency to allocate more points to the ingroup versus giving equal points to both groups, and these variables were positively and strongly related. A series of exploratory factor analyses of the Tajfel matrix and coded strategy variables that used different methods of extraction and rotation suggested that all of these variables loaded on one factor, with the P vs. FAV and coded Equality variables loading negatively and the remaining variables loading positively. To examine and distinguish discriminatory and prosocial intergroup behaviour, the current research first standardized then aggregated the MD vs. MJP + MIP, FAV vs. MJP, FAV vs. P, Ingroup Max, Outgroup Min, and Relative scores as one variable to assess participants' degree of discriminatory behaviour, and the P vs. FAV and Equality scores as one variable to assess participants' degree of prosocial behaviour. Both of these variables demonstrated adequate psychometric properties in terms of their range, skew, and internal consistency (see Table 5).

Table 6

Intercorrelations among Tajfel matrix and Coded Strategy Criterion Variables in Study 2

	1	2	3	4	5	6	7	8
1. MD vs. MJP+MIP	—							
2. FAV vs. P	.69***	—						
3. FAV vs. MJP	.61***	.62***	—					
4. P vs. FAV	-.55***	-.68***	-.56***	—				
5. Ingroup Max	.64***	.62***	.45***	-.58***	—			
6. Outgroup Min	.50***	.57***	.48***	-.46***	.68***	—		
7. Relative	.55***	.64***	.53***	-.49***	.49***	.33**	—	
8. Equality	-.50***	-.40***	-.46***	.45***	-.38***	-.22*	-.56***	—

Note. † $p < .1$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Covariate analyses. As in Study 1, variables were identified as covariates if they increased the sensitivity of the primary hypothesis tests but omitted if they accounted for little to no unique variance in the criterion variables. The present study included an experimental manipulation designed to affect CIM scores, therefore, variables were also identified as covariates in the hypotheses tests if they were also related to the CIP or CIM predictor variables, and if they were independent of (unaffected by) the experimental manipulation (Tabachnick & Fidell, 2001). Table 7 shows that among all the individual difference and contextual variables, only SDO, hypercompetitiveness, ingroup identification, and perceived interest were related to at least one of the predictor and criterion variables. Further, a one-way (academic aptitude construal [neutral, high]) MANOVA on SDO, hypercompetitiveness, ingroup identification, and perceived interest

revealed no multivariate or univariate main effect on any of these variables, $F_s < 1.5$, suggesting that their relations were not affected by the experimental manipulation. In addition, a one-way (Sex [female, male]) multivariate analysis of covariance (MANCOVA) on self-reported CIM, CIP, and all of the criterion variables, with SDO, hypercompetitiveness, ingroup identification, and perceived interest as covariates revealed no multivariate or univariate main effect of sex, $F_s < 2.6$, $p_s > .1$, suggesting that sex did not contribute any unique variance to any of the predictor or criterion variables over and above the covariates. On the whole these results suggest that participants who reported relatively high levels of SDO, hypercompetitiveness, and ingroup identification also reported greater levels of CIM and either favoured their ingroup more or pursued intergroup equality less when allocating points in the Tajfel matrices, regardless of the experimental manipulation. Further, participants who reported high levels of interest in the task also reported weaker levels of CIM and tended to use discriminatory strategies less and equality strategies more when allocating points in the Tajfel matrices. To increase the ability of the analyses to detect experimentally-induced changes in self-reported CIM, CIP, incentive appeal and discriminatory or prosocial behaviour, all hypotheses tests and regression analyses reported below included SDO, hypercompetitiveness, ingroup identification, and perceived interest as covariates.

Table 7

*Zero-order Correlations between Individual Difference, Predictor, and Criterion**Variables in Study 2*

Variable	1	2	3	4	5	6	7
1.	—						
2.	.32**	—					
3.	.36***	.13	—				
4.	.09	-.02	.17†	—			
5.	-.12	.01	-.06	-.19†	—		
6.	.11	.24*	.10	.10	.17†	—	
7.	.22*	-.06	.03	-.09	-.14	.20*	—
8.	.30**	.21*	.18†	-.28**	.10	.27**	.59***
9.	.08	.14	.06	-.25*	.06	.12	.22*
10.	-.08	-.20*	-.12	.17†	-.15	-.24**	-.22*
11.	.09	.18†	.09	-.23†	.11	.19†	.24*
12.	.12	.15	.10	-.25*	.13	.20*	.26**
13.	-.26**	-.26**	-.18†	.19†	.03	-.21*	-.20*

Note. 1. Social Dominance Orientation. 2. Hypercompetitiveness. 3. Ingroup identification. 4. Perceived interest. 5. Perceived difficulty. 6. Incentive appeal. 7. Competitive intergroup perceptions. 8. Competitive intergroup motivations. 9. Total points to ingroup. 10. Total points to outgroup. 11. Difference in points to ingroup vs. outgroup. 12. Discriminatory behaviour. 13. Prosocial behaviour. The relations between selected covariates in Study 2 and the predictor and criterion variables are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$.

Table 7 (Continued)

Variable	8	9	10	11	12	13
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.	—					
9.	.36***	—				
10.	-.38***	-.76***	—			
11.	.40***	.94***	-.93***	—		
12.	.38***	.87***	-.88***	.93***	—	
13.	-.34***	-.63***	.64***	-.68***	-.70***	—

Note. 1. Social Dominance Orientation. 2. Hypercompetitiveness. 3. Ingroup identification. 4. Perceived interest. 5. Perceived difficulty. 6. Incentive appeal. 7. Competitive intergroup perceptions. 8. Competitive intergroup motivations. 9. Total points to ingroup. 10. Total points to outgroup. 11. Difference in points to ingroup vs. outgroup. 12. Discriminatory behaviour. 13. Prosocial behaviour. The relations between selected covariates in Study 2 and the predictor and criterion variables are in boldface.

*** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$.

Experimental Results and Hypothesis Tests.

A one-way (academic aptitude construal [neutral, high]) ANCOVA with incentive appeal as the dependent measure was conducted to verify that the participants in the high academic aptitude condition believed performing well on the performance task had greater appeal than participants in the neutral academic aptitude condition. There was a

significant main effect, such that participants in the former condition reported greater incentive appeal than participants in the latter condition (see Table 8).

H1: There is a positive, non-redundant relation between CIP and CIM. As seen in Table 7, CIP and CIM shared a significant and strong, positive correlation, $r(101) = .59, p < .001$. A partial correlation that controlled for SDO, ingroup identification, hypercompetitiveness, perceived interest, incentive appeal, and the experimental manipulation of academic aptitude construal also revealed a strong positive correlation between CIP and CIM, $r(95) = .57, p < .001$, which indicates that both measures shared 33% of their variance. Thus, H1 was supported.

H2: CIP and CIM have unique antecedents. If the present study was successful at manipulating CIM independently of CIP, one would expect an increase of self-reported CIM in the high versus the neutral academic aptitude condition, but no such effect on self-reported CIP. This hypothesis was supported by two one-way (academic aptitude construal [neutral, high]) ANCOVAs, one on self-reported CIP and the other on self-reported CIM. There was a significant univariate main effect on self-reported CIM scores, such that participants in the high academic aptitude condition reported greater levels of CIM than their peers in the neutral academic aptitude condition, as expected. In contrast, participants' self-reported levels of CIP did not differ significantly across conditions (see Table 8). The present study, therefore, supported Hypothesis 2, such that CIM was manipulated independently of CIP.

H3: CIP and CIM have distinct influences on intergroup behaviour. Following the motivational perspective, an increase in CIM should result in a stronger tendency toward intergroup discrimination, even in the absence of a corresponding

increase in CIP. This hypothesis was tested by two one-way (academic aptitude construal [neutral, high]) MANCOVAs; one included the total number of points allocated to the ingroup, the outgroup, and the bias in points to the ingroup versus the outgroup as dependent measures, and the other included the discriminatory and prosocial behaviour aggregates as dependent measures. As shown in Table 8, the observed means were in the expected direction such that participants tended to allocate more points to the ingroup and fewer points to the outgroup in the high versus the neutral academic aptitude condition. However, the results of the MANCOVAs revealed that the multivariate main effects were not significant, $F_s < 2$, $p_s > 1$. Follow-up analyses revealed the univariate main effect was only marginally significant for the points awarded to the outgroup, the bias in points awarded to the ingroup versus the outgroup, and prosocial behaviour (see Table 8). This suggests that participants in the high academic aptitude condition were reluctant to give outgroup members a large or equal amount of points compared with their peers in the neutral academic aptitude condition, but were not more inclined to engage in explicitly discriminating or punitive allocation tendencies toward the outgroup, providing partial support for the motivational perspective⁷.

⁷ Given the range of self-reported CIP scores, they were centered (Aiken & West, 1991) and their interaction with the academic aptitude construal manipulation (-1 = neutral; 1 = high) was computed to determine if CIP moderated the effect of this manipulation. A series of analyses that regressed each of the criterion variables on CIP, the academic aptitude construal manipulation, and their interaction revealed that this interaction was never significant.

Table 8

Effects of CIM Experimental Manipulation on Criterion Variables in Study 2

	Academic aptitude construal				Univariate main effects of CIM		
	Neutral		High		<i>F</i>	<i>p</i>	η^2
	<i>M</i>	(<i>SE</i>)	<i>M</i>	(<i>SE</i>)			
Self-reported incentive appeal	4.86	(.16)	5.85	(.15)	20.44	<.001	.17
Self-reported CIP	2.98	(.22)	3.49	(.22)	2.67	>.1	.03
Self-reported CIM	3.79	(.20)	4.35	(.19)	4.11	.045	.04
Total points to ingroup	188.99	(4.31)	198.98	(4.18)	2.72	>.1	.03
Total points to outgroup	151.18	(3.93)	140.45	(3.82)	3.77	.055	.04
Bias in points to ingroup vs. outgroup	37.80	(7.68)	58.53	(7.46)	3.68	.058	.04
Discriminatory behaviour	-.05	(.11)	.09	(.11)	.76	>.1	.01
Prosocial behaviour	.13	(.11)	-.16	(.11)	3.33	.071	.03

Correlational and regression results. The motivational perspective predicts that any changes in discriminatory behaviour are due to corresponding changes in CIM. This implies that discriminatory behaviour was more strongly related to CIM than CIP or incentive appeal in the present study.

To test this idea, a series of hierarchical regression analyses were conducted on all of the criterion variables that included the academic aptitude construal manipulation (-1 = neutral; 1 = high) as a predictor in the first block, the covariate measures as predictors in the second block, and finally, self-reported levels of incentive appeal, CIP, and CIM as

predictors in the final block. Table 9 compares the contextual influences of self-reported incentive appeal, CIP, and CIM on the criterion variables in Study 2 according to their observed zero-order correlations and standardized regression weights from the final block of each regression analysis.

Table 9

Prediction of Criterion Variables in Study 2

	Incentive appeal		CIP		CIM		R ²
	<i>r</i>	β	<i>r</i>	β	<i>r</i>	β	
Total points to ingroup	.12	-.02	.22*	.05	.36***	.25[†]	.18
Total points to outgroup	-.24**	-.10	-.22*	-.04	-.38***	-.27*	.20
Bias in points to ingroup vs. outgroup	.19 [†]	.04	.24*	.05	.40***	.28*	.20
Discriminatory behaviour	.20*	.11	.26**	.10	.38***	.21	.19
Prosocial behaviour	-.21*	-.06	-.20*	-.05	-.34***	-.13	.21

Note. All analyses controlled for the academic aptitude construal manipulation (-1 = neutral; 1 = high), SDO, hypercompetitiveness, ingroup identification, and perceived task interest. β = standardized beta weights. Standardized beta weights are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, [†] $p < .1$.

The general trend is that self-reported CIM was more strongly related to each of the criterion variables—in the expected direction—than self-reported CIP or incentive appeal. Similar to Study 1, the zero-order correlations suggested both self-reported CIP

and CIM were associated with more discriminatory and less prosocial behaviour toward the outgroup. However, the regression analyses revealed that the influence of self-reported CIP and incentive appeal on each of the criterion variables was never significant once the influence of self-reported CIM was included. Further, self-reported CIM scores emerged as the final significant predictor for each of the point allocation variables, but its influence was not statistically significant for the discriminatory or prosocial behaviour aggregates. These results contradict the idea that CIP and CIM both contribute to intergroup behaviour as argued by the independence perspective, and are generally more consistent with the idea that CIM primarily drives intergroup behaviour as argued by the motivational perspective. These results also provide some support for an additional corollary of the motivational perspective, which suggests that the observed effects of the experimental manipulation would be mediated by self-reported levels of CIM.

Mediation results. Full mediation is indicated when a predictor variable has a significant influence on the criterion variable (*c*) and an additional mediator variable (*a*), the mediator variable has a significant influence on the criterion variable (*b*), and the relation between the predictor and criterion variable is reduced to non-significance when the influence of the mediator is accounted for (*c'*; Baron & Kenny, 1986; MacKinnon, Fairchild, & Fritz, 2007). In the present study, the academic aptitude construal manipulation affected self-reported incentive appeal and CIM scores. The motivational perspective would be supported, therefore, if the effect of the experimental manipulation on participants' point allocation to the outgroup, point allocation bias to the ingroup versus the outgroup, and prosocial behaviour was reduced to non-significance when self-reported CIM, rather than self-reported incentive appeal, was included as a mediator.

It is noteworthy, therefore, that for each criterion variable in which the ANCOVAs indicated a marginally significant effect of academic aptitude construal, the regression analyses revealed the effect of the experimental manipulation was non-significant in the final block after including self-reported incentive appeal, CIM and CIP, $\beta_s < .12$, $p_s > .1$. These analyses further indicated that self-reported CIM—not incentive appeal—was the only significant predictor of the total points given to the outgroup and the difference in points given to the ingroup versus the outgroup (Table 9), although the effects of self-reported CIM and incentive appeal on prosocial behaviour were both not significant.

To provide a stronger test of mediation, Preacher and Hayes' (2008) macro was used. This macro uses bootstrapping, a computational method that involves repeatedly sampling and estimating regression coefficients from the current data set over thousands of iterations to construct a sampling distribution of regression coefficients and confidence intervals for the indirect or mediating variable(s). Compared with the conventional Sobel tests or causal steps approach by Baron & Kenny (1986) for assessing mediation, bootstrapping methods provide greater power while maintaining low Type 1 error rates (for reviews and simulation studies see Mackinnon, Lockwood, Hoffman, & West, 2002; Preacher & Hayes, 2004; Shrout & Bolger, 2002). The Preacher and Hayes (2008) macro also has greater flexibility in that it can test for the possibility of more than one simultaneously operating mediator. As part of this analysis the unstandardized estimate of a mediated effect, which is typically computed as the product of the coefficients from the relation between the predictor and the mediator variables (a) and the relation between the mediator and criterion variables (b), is tested for its significance from zero (Mackinnon et al., 2002; Sobel, 1982). In addition, a mediation effect with associated bias-corrected

(BC) confidence intervals that do not include zero within their upper and lower limits are interpreted as being significantly different from zero.

For the present study, Preacher and Hayes' (2008) macro was run in SPSS 17.0 and used in separate analyses for the amount of points given to the outgroup, the bias in points given to the ingroup relative to the outgroup, and the prosocial behaviour criterion variables. As with the prior regression analyses, the experimental manipulation of academic aptitude construal was entered as the independent variable, all of the prior covariates were included, self-reported incentive appeal (a_1b_1) and CIM (a_2b_2) were entered as potential mediators, and the macro produced regression coefficients and confidence intervals from a sampling distribution of 5000 iterations. For each criterion variable tested, the effect of the academic aptitude construal manipulation on the criterion variable was rendered either non-significant, or significant but less robust when the mediators were included (see Table 10). For the analysis of points given to the outgroup, the specific mediation effect of incentive appeal was not significant from zero, but the mediation effect of CIM was significant from zero. For the analysis of points given to the ingroup versus outgroup, the mediation effect of incentive appeal was not significant from zero, and the mediation effect of CIM was also significant from zero. Finally, for the analysis of prosocial behaviour, the mediation effects of both incentive appeal and CIM were not significant from zero. In sum, self-reported CIM, rather than incentive appeal, mediated the effects of the experimental manipulation on the amount of points allocated to the outgroup and the ingroup versus the outgroup, but neither variable specifically mediated the experimental effect on prosocial behaviour.

Table 10

Mediation Effects on Select Criterion Variables in Study 2

Criterion variables	R ²	<i>c</i>	<i>c'</i>	Self-reported incentive appeal			Self-reported CIM		
				<i>a</i> ₁ <i>b</i> ₁	LL	UL	<i>a</i> ₂ <i>b</i> ₂	LL	UL
Total points to outgroup	.20	-5.37 [†]	-2.69	-1.18	-3.98	.94	-1.52[†]	-4.14	-.14
Bias in points to ingroup vs. outgroup	.20	10.36 [†]	6.32	-1.01	-3.16	5.94	3.15[†]	.32	8.25
Prosocial behaviour	.22	-.15 [†]	-.10	-.24	-.10	.05	-.24	-.09	.00

Note. *c* = effect of the academic aptitude construal manipulation (-1 = neutral; 1 = high) on the criterion variable. *c'* = effect of the academic aptitude construal manipulation on the criterion variable after including self-reported incentive appeal and CIM as mediators. *a*₁*b*₁ = unstandardized estimate of mediated effect. LL = Lower limit of Bias-corrected 95% CI. UL = Upper limit of Bias-corrected 95% CI. Significant mediation effects are in boldface. ****p* < .001; ***p* < .01; **p* < .05, [†]*p* < .1.

Discussion

The results of Study 2 generally supported the current conceptual framework which holds that CIM and CIP are related but distinct variables that may have unique causal determinants, as well as unique influences on intergroup discrimination. In line with this framework, self-reported CIP and CIM were strongly related, but further analyses showed both variables were not redundant with each other. In particular, participants reported significantly lower levels of CIP than CIM across the study, as may be expected considering all participants were explicitly told that their ingroup and

outgroup was not in competition. Further, participants reported greater levels of CIM when they were told they would be completing a task that held greater intrinsic value for strong performance. Thus, the present study demonstrated that it is possible to manipulate CIM while maintaining low levels of CIP.

The results were also generally in line with the idea that CIP and CIM had distinct effects on intergroup behaviour. The present study conceptually replicated the trend in Study 1 that self-reported CIP and CIM were both significantly correlated with measures of discriminatory behaviour, although the regression analyses suggested that CIM was more strongly related to discriminatory behaviour than CIP. The MANCOVA analyses suggested that the experimental manipulation resulted in participants giving fewer points and engaging in less prosocial behaviour toward the outgroup, rather than giving more points and engaging in more discriminatory behaviour on behalf of the ingroup. It is noteworthy that self-reported CIM, rather than the perceived appeal of the incentive, mediated the effect of the academic aptitude construal manipulation on the points allocated to the outgroup and the bias in points allocated to the ingroup versus the outgroup; however, self-reported CIM nor incentive appeal specifically mediated the effect of the academic aptitude construal manipulation on prosocial behaviour. The observed increase in CIM also did not result in corresponding changes across all measures of discriminatory behaviour.

These results can be summarized as providing no support for the independence perspective while providing limited support for the motivational perspective. The regression analyses revealed that self-reported CIP and CIM did not both simultaneously predict greater levels of discriminatory behaviour, as would be expected by the

independence perspective. In contrast, self-reported CIM played a stronger role in the prediction of intergroup discrimination than CIP or the mere appeal of performing the task well, as would be expected by the motivational perspective. The experimentally-induced increase in CIM did not result in uniformly strong surges of intergroup discrimination that were all mediated by self-reported CIM, however.

In light of the generally moderate levels of intergroup discrimination observed in the present study and the relatively low levels of discriminatory intentions observed in Study 1, it may be that participants in both studies did not feel they had adequate justification for stronger, more hostile forms of discrimination. One of the objectives for Study 3, therefore, was to determine the impact of an active, salient competitive perception on CIM and intergroup discrimination. In line with the current conceptual framework and the observation in the present study that CIM can be manipulated independently of CIP, it should follow that CIP and CIM can be manipulated independently of each other, and doing so should enhance our understanding of how and when intergroup competition produces intergroup discrimination.

Study 3

The goals of Study 3 were similar to those of Study 2 with respect to experimentally inducing distinct levels of CIP and CIM, then assessing their corresponding effects on intergroup discrimination. The present study was also designed to investigate the potential impact of an experimental manipulation that targeted participants' level of CIP on intergroup discrimination.

Study 3 presented participants with a more natural group setting between Western and Waterloo students and used similar procedural details as Study 2 regarding the

eventual completion of a group performance task and assessing discriminatory behaviour via the Tajfel point allocation matrices. CIP was manipulated in Study 3 by telling participants the task either was or was not set up as an organized competition between the universities. The present study used a similar academic aptitude construal manipulation of CIM as Study 2 by telling participants the performance task was negatively related, completely unrelated, or positively related to academic performance. It was expected that self-reported CIP and CIM would be strongly but not superfluously correlated (Hypothesis 1), and that the experimental manipulations would result in different patterns of results for both variables (Hypothesis 2). Specifically, it was expected that participants would report greater CIP scores when they were told a competitive intergroup relationship was present, rather than absent, and that this effect would not depend on the academic aptitude construal manipulation. In contrast, while it was expected that participants would report greater CIM scores when they were told that performing well on the group performance task reflected high, rather than low or neutral academic aptitude, this effect was expected to be amplified by the presentation of a competitive versus a non-competitive intergroup relationship. In particular, it was expected that participants would report the greatest CIM scores when they were told they were in a competition, and the performance task reflected high, rather than low or neutral levels of academic aptitude.

Hypothesis 3 suggests that CIP and CIM have distinct effects on intergroup behaviour, and the predictions from the independence and motivational perspectives are unique. The independence perspective would suggest that experimentally increasing CIP or CIM would result in additive increases in intergroup discrimination only. The

motivational perspective would suggest that a salient competition between groups will only lead to intergroup discrimination if the group members themselves are strongly motivated to compete on behalf of their group. These competing predictions were investigated in Study 3.

Method

Participants

Participants were 200 Western University students (69 men, 131 women; $M_{\text{age}} = 18.32$, $SD_{\text{age}} = 1.50$) from the first-year introductory psychology subject pool who participated for course credit.

Procedure & Materials

Participants were invited to the lab in groups of up to four individuals under the guise of completing a study that broadly examined the different factors that affect people's performance. When participants arrived, the experimenter explained that they were participating in a joint study between researchers from Western University and the University of Waterloo who study task performance and were conducting the study at their respective institutions. Fictional names of Waterloo professors were inserted on the letter of information to support this cover story.

The experimenter explained that the study was centred on participants' performance on a perceptual task; the first stage of the session involved completing a practice round of the task, the next stage involved completing measures of personality and attitudes as well as determining the conditions for participants in a future session of the current study, and the last stage would involve completing the real perceptual performance task. The experimenter explained that every participant would be

automatically assigned to one session that consists of three Western and three Waterloo students, regardless of whether one's participation occurred on different times or days from others in one's session. Similar to Study 2, the experimenter also explained that the study was configured to assess the group performances of Western and Waterloo students in each session, and that the researchers were primarily interested in group and not individual performances. The experimenter then escorted each participant to their own individual rooms where they completed all of the materials, although it was reinforced that they were working in a group with other Western students such that all Western and Waterloo students' performances were aggregated together to form a Western and Waterloo group performance score for each session.

Practice perceptual task. After obtaining informed consent, the experimenter loaded a program that was framed as a practice round of the perceptual performance task participants would complete at the end of their session. The practice round consisted of two tasks, a lexical decision task and an object recognition task, both of which were administered with Direct RT® 2006 software.

The lexical decision task presented successive trials of letter sequences briefly on the screen and asked participants to indicate if they saw a word or nonword. Each trial began by presenting a blank screen for 2000ms. This screen was then replaced by a masking stimulus (“#####”) which remained in the center of the screen for 75ms, followed by one of the target letter sequences which appeared on the screen for 200ms, followed by a prompt for participants to indicate whether the letter sequence they saw was a word or nonword. Participants completed 16 trials that presented 8 words and nonwords in randomized order, and the program never provided feedback on whether

participants' responses were correct. The trials that presented real words consisted of neutral stimuli ("desk," "airplane," "vehicle," "car," "pencil," "keyboard," "mouse," "book") that were unrelated to the context of the study. The program then loaded the object recognition task, which was identical to the lexical task except that the stimuli consisted of images with a variable number of black geometric shapes appearing over a white background, and participants were asked to select from two response options that described how many shapes they saw on the previous screen (see Appendix F for sample images). After completing this task, the program prompted participants to find the experimenter.

Performance task information. The experimenter reminded participants that each individual in the current session was answering questions in conjunction with other students from their own university, such that people's individual performances would be aggregated into a university group performance score for their session. The experimenter also explained the decision-making portion of the study, which was based on a procedure employed by Scheepers et al. (2006a). Participants were to receive a set amount of feedback opportunities at various points throughout the actual performance task. A feedback opportunity consisted of one screen that appeared immediately after a response had been given which told the participant if their previous answer was correct or incorrect, and it was stressed that receiving feedback opportunities led to improved scores on the performance task. The experimenter explained that all participants were asked to assign feedback opportunities to other participants in a future session; this allowed the researchers to investigate how various conditions affect performance. Thus, participants' feedback opportunities in the current session were ostensibly predetermined by

participants in a previous session of the study, and accordingly, the program would also ask everyone in the current session to decide how many feedback opportunities would be given to participants in a future session.

The experimenter then loaded a program which gave every participant a session and identification number to process their receiving of feedback opportunities from a previous session (each participant was given the same identification and session number). The program then reinforced the experimenter's instructions by explaining the group configuration of the performance task in a similar manner was that used in Study 2 with a few exceptions. The program instructions always mentioned that the performance task was a validated measure of perceptual ability. The program also told participants that the performance task questions would appear on the screen for no longer than 5 seconds, implying that excessively rushing or delaying their responses would lead to a lower group performance score. The remaining instructions consisted of the experimental manipulations presented in the following order.

Experimental manipulations. The present study used a 2 (competitive intergroup relationship: absent vs. present) x 3 (academic aptitude construal: low vs. neutral vs. high) design and the experimental manipulations were framed as further information about the group performance task. In one page, the program told participants in the competitive-relationship-absent condition that the performance task was not set up as a competition between Western and Waterloo students, and participants in the competitive-relationship-present condition that the task was set up as a competition between the two universities.

Similar to Study 2, the program told participants in the neutral academic aptitude condition that the group task measured perceptual performance and was unrelated to academic achievement. In contrast, the program told participants in the low- and high-academic aptitude conditions that the group task was also negatively and positively related to academic performance, respectively. Participants in these conditions were given the following description about the context corresponding to their respectively assigned academic aptitude construal [low vs. high] condition:

“Prior research has also shown that people who perform well on this task also tend to perform VERY [POORLY vs. WELL] in other important areas related to academic achievement and intellectual performance. This finding has been proven by several studies. Researchers believe that the reasons for this finding are because this task measures attention to detail very closely, and that those who do well on this task can respond very quickly to external stimuli, and that this ability [gives them trouble vs. helps them] with processing more broad or relevant information in their environments, keeping their focus for long periods of time, and setting and following important long-term priorities. Therefore, it is quite reasonable to think that performing well on this task is limited not only to one’s perceptual performance for this task. In fact, performing well on this task indicates that one is more likely to perform VERY [POORLY vs. WELL] on measures of academic achievement.”

Comprehension Questions. Following the experimental manipulation, the program administered the same set of comprehension questions about the session and performance task as Study 2, with some new questions on the value of feedback opportunities for improving performance, how feedback opportunities get assigned to participants in future sessions, whether participants correctly assessed if the researchers set up the current context as a competition, and how performance on the task was related to academic achievement. As with Study 2, the feedback on whether all questions were answered correctly was in line with the participants’ assigned conditions.

Predictor & Contextual Measures. Following the comprehension questions the program administered the CIP, CIM, incentive appeal, perceived task difficulty, and task interest questionnaires from Study 2 with a few changes. The incentive appeal and perceived difficulty questionnaire in Study 3 each featured an additional item to enhance their reliability and construct validity (see Appendix A). Study 3 also included a four-item measure of participants' level of contact with Waterloo students, and a three-item measure of participants' perceived social status of Western University relative to the University of Waterloo to rule out, or control for their potential influence on the predictor or criterion variables. The items for these measures were adapted from other research on intergroup contact (Tausch, Tam, Hewstone, Kenworthy & Cairns, 2007) and perceived social status and relative deprivation (Beaton & Tougas, 1997; Tropp & Wright, 1999); the full list of items and their scales are shown in Appendix A.

Criterion Variables. Study 3 assessed discriminatory behaviour using the same Tajfel matrices and open-ended question about the reasons for participants' point allocation tendencies as Study 2 with a few exceptions⁸. The program in the present study showed participants the same set of detailed Tajfel matrix instructions as Study 2 (see Appendix D) except that participants were told the points represented feedback opportunities for Western and Waterloo students who would complete the performance task in a future session. The mean interrater agreement for the open-ended question across all dimensions in Study 3 was high, $r(159) = .79, ps < .001$, with the coder intercorrelations ranging from .74 to .86 across all dimensions.

⁸ To increase the sensitivity of the pull scores, the present study included an extra set of Tajfel matrices using the same presentation of column choices in Appendix E for all matrix types, resulting in a total of 24 matrices.

Individual Difference Variables. Following the criterion variables, the program administered a section of demographic and individual difference measures that was similar to Study 2 with a few exceptions. Because some of the filler measures in Study 3 were shorter than Study 2, the full 16-item SDO scale (Pratto et al., 1994) was used in Study 3. To minimize participants' suspicion of the cover story, the filler ideological measures of political and economic system-justification and belief in a just world were replaced with more neutral personality scales that included the Decisiveness, Discomfort with ambiguity, Preference for order and Preference for predictability subscales of the Need for Closure scale (Webster & Kruglanski, 1994), the brief Big-5 Personality scale, and five items from the Reynolds (1982) social desirability scale. All other individual difference measures from Study 2 were administered using a similar interspersed order in Study 3.

Results

Data Preparation

The final sample of 165 participants (50 men, 115 women; $M_{\text{age}} = 18.30$, $SD_{\text{age}} = 1.51$) for analysis excluded 35 individuals who thought either the group context between Western and Waterloo students or the description of the performance task was fictional⁹. All of the participants from the final sample gave correct responses, or they changed an initially incorrect answer to the correct response in its corresponding follow-up question for all of the comprehension questions about the instructions for the performance task, group context, recognition of whether the researchers set up the performance task as a competition, and assessment of how the performance task was ostensibly related to

⁹ Between 24-30 participants were randomly assigned to each cell of the present study. A chi-square test indicated the proportion of participants from the final sample was evenly distributed across the experimental cells, $\chi^2(5) = 1.07$, $p > .1$.

academic achievement. Thus, everyone in the final sample correctly understood and believed the group context and the instructions regarding the performance task in their assigned condition.

Participants' mean scores on the individual difference, predictor, and criterion variables are presented in Table 11. Consistent with Study 2, the Tajfel matrix allocation and coded strategy criterion variables were all strongly related in Study 3, $r_s(159-163) = |.14| - |.84|$, $M_{rs} = |.52|$, $SD_{rs} = |.18|$, therefore, they were all standardized and aggregated into the same discriminatory and prosocial behaviour aggregates as Study 2.

Table 11

Psychometric Properties of Variables in Study 3

Measure	<i>n</i>	<i>M</i>	<i>SD</i>	α	Potential range	Actual range	Skew
SDO	162	2.80	.96	.85	1.0-7.0	1.0-4.9	.06
Hypercompetitiveness	164	4.96	1.14	.71	1.0-7.0	1.0-7.0	-.59
ID	164	5.07	1.24	.91	1.0-7.0	1.0-7.0	-.84
Perceived interest	164	4.56	1.26	.88	1.0-7.0	1.0-7.0	-.05
Perceived difficulty	164	3.61	1.12	.76	1.0-7.0	1.0-6.0	-.87
Incentive appeal	164	5.35	1.47	.84	1.0-7.0	1.0-7.0	-.78
Outgroup contact	164	2.99	1.55	.82	1.0-7.0	1.0-7.0	.58
Perceived status of ingroup vs. outgroup	164	4.60	.84	.68	1.0-7.0	2.7-7.0	1.22

CIP	163	3.98	2.44	.93	1.0-7.0	1.0-7.0	-.01
CIM	163	4.12	2.23	.95	1.0-7.0	1.0-7.0	-.16
Total points to ingroup	165	377.83	57.48	—	168.0-528.0	250.0-528.0	.85
Total points to outgroup	165	308.49	55.40	—	168.0-528.0	180.0-444.0	-.88
Bias in points to ingroup vs. outgroup	165	69.34	106.06	—	-336.0-336.0	-154.0-288.0	1.00
MD vs. MJP + MIP	165	2.61	4.35	—	-12.0-12.0	-7.5-12.0	.93
FAV vs. P	165	-1.65	4.63	—	-12.0-12.0	-7.5-9.0	.65
FAV vs. MJP	165	2.92	4.69	—	-12.0-12.0	-6.8-12.0	1.00
P vs. FAV	165	1.80	4.60	—	-12.0-12.0	-6.3-9.0	-.62
Ingroup Max	161	.17	.41	—	-1.0-1.0	-1.0-1.0	1.22
Outgroup Min	161	.01	.48	—	-1.0-1.0	-1.0-1.0	.02
Relative	161	.36	.53	—	-1.0-1.0	-1.0-1.0	.07
Equality	161	.63	.49	—	-1.0-1.0	0.0-1.0	-.53
Discriminatory behaviour	165	.00	.77	.87	-2.6-2.6	-1.4-1.8	1.01
Prosocial behaviour	165	.00	.88	.72	-2.6-2.6	-1.5-1.2	-.50

Covariate Analyses. As in Study 2, variables were identified as covariates in the hypotheses tests if they were related to self-reported CIP or CIM as well as at least one of

the behavioural criterion variables, and if they were independent of the experimental manipulation. Table 12 shows that among all the individual difference and contextual variables in Study 3, only hypercompetitiveness and ingroup identification were related to one or more predictor and criterion variables. A 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) MANOVA revealed that both of these variables were unaffected by the experimental manipulations, $F_s < 2.40$, $p_s > .1$. With regard to the influence of sex, a series of one-way (Sex [female, male]) MANCOVAs with ingroup identification and hypercompetitiveness as covariates revealed no significant multivariate or univariate main effects of sex on the CIP and CIM predictors, $F_s < .1$, and no multivariate main effect of sex on the criterion variables, $F(4, 156) = 1.76$, $p > .1$, but there were significant univariate main effects of sex on the allocation of points to the ingroup, $F(1, 159) = 6.21$, $p = .014$, $\eta^2 = .04$, the allocation of points to the ingroup versus the group, $F(1, 159) = 4.97$, $p = .027$, $\eta^2 = .03$, and a marginally significant main effect on discriminatory behaviour, $F(1, 159) = 3.26$, $p = .073$, $\eta^2 = .02$. Each of these effects revealed that men generally gave more points to the ingroup and engaged in more discriminatory behaviour than women. Given that sex did not affect self-reported CIP or CIM in Study 3 and it did not contribute unique variance to any of the predictor or criterion variables in Studies 1 and 2, it was not included as a covariate in Study 3. Thus, all of the analyses reported below included ingroup identification and hypercompetitiveness as covariates¹⁰.

¹⁰ The results of all of the multivariate and univariate analyses of variance on the criterion variables in Study 3 were virtually unchanged when sex was included as a covariate.

Table 12

*Zero-order Correlations between Individual Difference, Predictor, and Criterion**Variables in Study 3*

Variable	1	2	3	4	5	6	7
1.	—						
2.	.21**	—					
3.	-.04	.21**	—				
4.	-.02	-.06	.01	—			
5.	-.17*	-.13	-.09	-.15†	—		
6.	.02	.16*	.12	.25**	-.09	—	
7.	-.01	-.01	.02	-.03	.08	.09	—
8.	.20*	.12	.19*	.09	-.09	.08	-.16*
9.	-.07	-.01	.15*	.03	.15†	.21**	.07
10.	-.01	.14†	.16*	.13	.12	.43***	.10
11.	.03	.11	.15†	.13†	.04	.33***	.24**
12.	-.10	-.13	-.17*	-.07	-.04	-.25**	-.13†
13.	.07	.13	.17*	.11	.04	.31***	.20*
14.	.12	.18*	.17*	.08	.04	.28***	.18*
15.	-.09	-.20*	-.16*	-.08	-.07	-.12	-.06

Note. 1. Social Dominance Orientation. 2. Hypercompetitiveness. 3. Ingroup identification. 4. Perceived interest. 5. Perceived difficulty. 6. Incentive appeal. 7. Outgroup contact. 8. Perceived status of ingroup vs. outgroup. 9. Competitive intergroup perceptions. 10. Competitive intergroup motivations. 11. Total points to ingroup. 12. Total points to outgroup. 13. Difference in points to ingroup vs. outgroup. 14. Discriminatory behaviour. 15. Prosocial behaviour. The relations between selected covariates in Study 3 and the predictor and criterion variables are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$.

Table 12 (Continued)

Variable	8	9	10	11	12	13	14	15
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.	—							
9.	.13	—						
10.	.22**	.79***	—					
11.	.09	.43***	.55***	—				
12.	-.10	-.48***	-.54***	-.76***	—			
13.	.10	.48***	.58***	.94***	-.94***	—		
14.	.14†	.44***	.54***	.90***	-.87***	.94***	—	
15.	-.20**	-.45***	-.51***	-.68***	.67***	-.72***	-.74***	—

Note. 1. Social Dominance Orientation. 2. Hypercompetitiveness. 3. Ingroup identification. 4. Perceived interest. 5. Perceived difficulty. 6. Incentive appeal. 7. Outgroup contact. 8. Perceived status of ingroup vs. outgroup. 9. Competitive intergroup perceptions. 10. Competitive intergroup motivations. 11. Total points to ingroup. 12. Total points to outgroup. 13. Difference in points to ingroup vs. outgroup. 14. Discriminatory behaviour. 15. Prosocial behaviour. The relations between selected covariates in Study 3 and the predictor and criterion variables are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$.

Experimental Results and Hypothesis Tests.

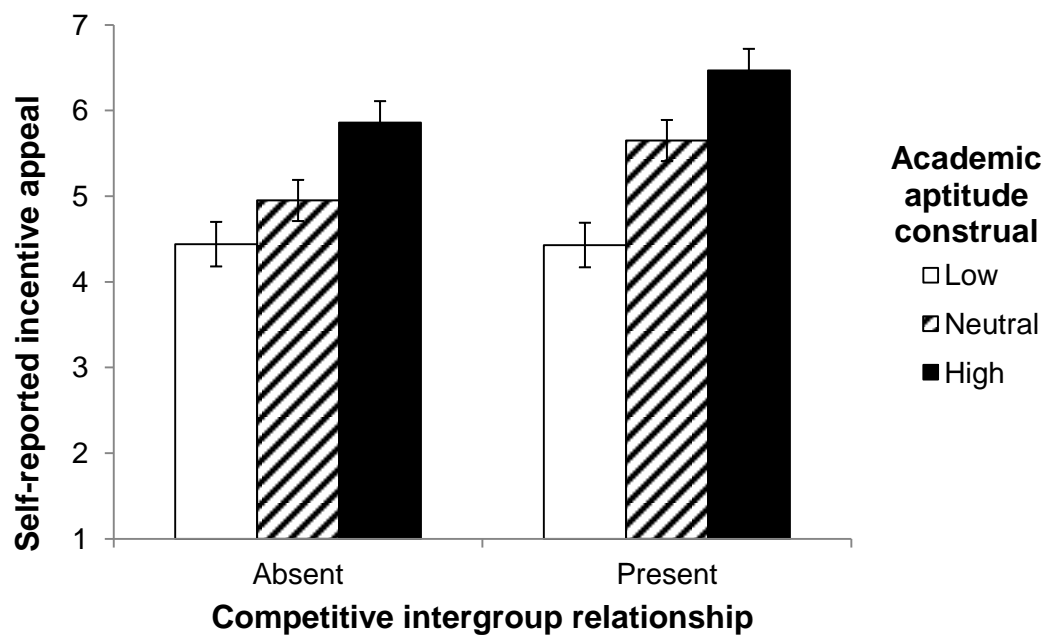
It was expected that the manipulation of low, neutral, and high academic aptitude would result in corresponding increases in the incentive appeal of performing well on the group performance task, and that incentive appeal would not be affected by the competitive intergroup relationship manipulation or the interaction between the two manipulations. It was also expected that the experimental manipulations would have no impact on participants' level of task interest, perceived difficulty, contact with outgroup members and perceived status between the ingroup and the outgroup.

A 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) ANCOVA on incentive appeal revealed a main effect of academic aptitude construal, $F(1, 155) = 24.09, p < .001, \eta^2 = .24$, and a main effect of the intergroup relationship, $F(1, 155) = 4.67, p = .032, \eta^2 = .03$, but no significant interaction (see Panel A of Figure 2). Pairwise comparisons using Bonferroni tests revealed that, as expected, participants in the low academic aptitude condition rated the task as having lower incentive appeal ($M = 4.43$) than participants in the neutral ($M = 5.30$) and high academic aptitude conditions ($M = 6.17$), $ps < .001$, and participants in the latter condition rated the performance task as having greater incentive appeal than the former two conditions, $ps \leq .001$. The main effect of the intergroup relationship on incentive appeal revealed that participants who were told the ingroup and outgroup were in competition rated the performance task as having greater incentive appeal ($M = 5.52$) than participants who were told there was no competition between the groups ($M = 5.08$).

A 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) MANCOVA on the remaining contextual variables

revealed no multivariate main effects of CIP or academic aptitude construal, but a significant multivariate interaction, $F(8, 306) = 2.04, p = .041, \eta^2 = .05$. Follow-up univariate tests revealed no significant univariate main effects or interactions on participants' level of task interest, perceived difficulty, and contact with outgroup members, as expected. For perceived status of the ingroup relative to the outgroup, there was a significant main effect of the intergroup relationship, $F(1, 155) = 4.36, p = .039, \eta^2 = .03$, such that participants reported greater perceived status relative to the outgroup when they were told a competition was present ($M = 4.73$) versus absent ($M = 4.47$). This main effect was qualified by a significant interaction, $F(1, 155) = 4.45, p = .013, \eta^2 = .05$. Pairwise comparisons using Bonferroni corrections revealed that the main effect of the intergroup relationship occurred only among participants in the high academic aptitude condition, $p = .003$ (see Panel B of Figure 2). The pairwise comparisons also revealed that when participants were told a competition between groups was absent, the ingroup's perceived status was rated as *higher* in the neutral compared with the high academic performance condition, $p = .031$; participants in neither of these cells reported significantly different levels of perceived status than participants in the low-academic-performance condition, $ps > .1$. These effects were unanticipated, therefore, the mediation analyses determined if perceived status transmitted the effect(s) of the experimental manipulations on the criterion variables.

Panel A



Panel B

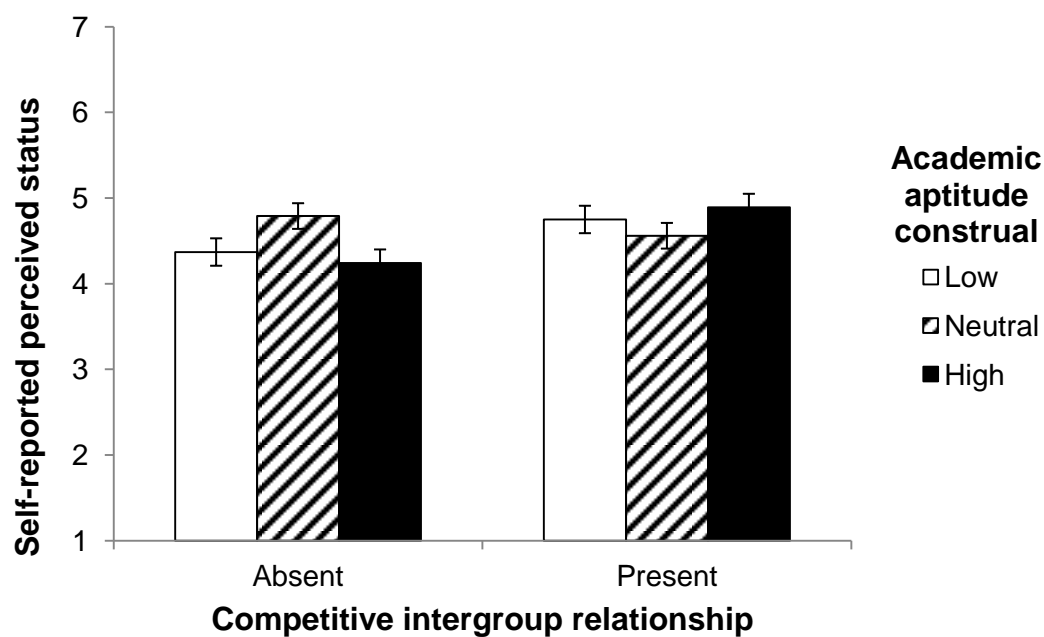


Figure 2. Self-reported incentive appeal (Panel A) and perceived status (Panel B) as a function of competitive intergroup relationship (absent, present) and academic aptitude construal (low, neutral, high), Study 3.

H1: There is a positive, non-redundant relation between CIP and CIM. As seen in Table 12, CIP and CIM shared a significant and strong, positive correlation, $r(161) = .79, p < .001$. A partial correlation that controlled for ingroup identification, hypercompetitiveness, and the experimental manipulations of competitive intergroup relationship and academic aptitude construal also revealed a strong positive correlation between CIP and CIM, $r(157) = .54, p < .001$, which indicates that both measures shared 29% of their variance. Thus, H1 was supported.

H2: CIP and CIM have distinct antecedents. If the present study was successful at experimentally manipulating CIM independently of CIP, one would expect different results for self-reported CIM and CIP scores. Because the measure of CIP was designed to assess the perception of an active intergroup competition, a main effect of the competitive intergroup relationship was expected for CIP scores, such that those participants who were told a competition between the ingroup and outgroup was present versus absent would report higher levels of CIP, and that this effect would not vary as a function of academic aptitude construal. In contrast, because the measure of CIM was designed to assess the degree to which participants desire to outperform the outgroup, it was expected that there would be a main effect of academic aptitude construal, such that participants would report higher levels of CIM when completing a task that had high versus low intrinsic value for strong performance (i.e., successful completion of a performance task that reflects high versus low academic aptitude). It was also expected that a significant interaction would emerge between the competitive intergroup relationship and academic aptitude construal manipulations in predicting CIM scores, with participants reporting the highest levels of CIM when they are told their group is in

competition with another group on a task that has strong intrinsic value (i.e., a task in which performing well reflects strong academic aptitude).

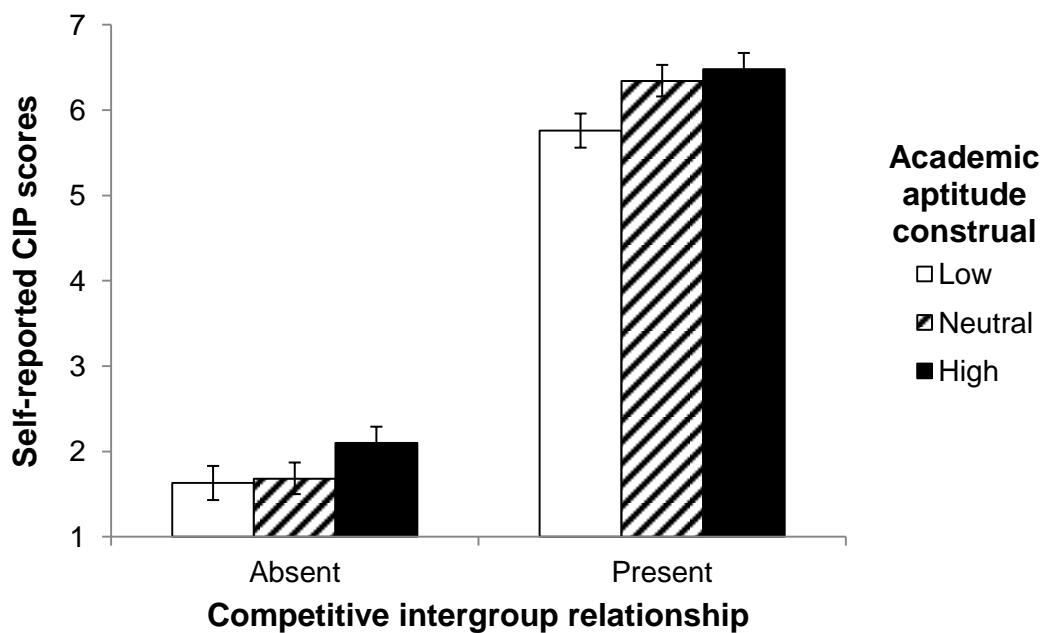
A 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) ANCOVA on self-reported CIP scores revealed a significant main effect of competitive intergroup relationship, $F(1, 155) = 790.95, p < .001, \eta^2 = .84$, and a significant main effect of academic aptitude construal, $F(2, 155) = 4.69, p = .011, \eta^2 = .06$, but the interaction between competitive intergroup relationship and academic aptitude construal was not significant, $F < 1$. As seen in Panel A of Figure 3, participants reported much higher CIP scores in the competitive-relationship-present ($M = 6.19$) versus the competitive-relationship-absent ($M = 1.80$) condition, and pairwise comparisons using a Bonferroni correction revealed that participants in the low-academic-aptitude condition reported significantly lower CIP scores ($M = 3.21$) than their peers in the high-academic-aptitude condition ($M = 3.69$), $p = .003$. The latter results suggest participants were more likely to perceive a competition between groups when they were completing a task with a strong versus a weak incentive; however, this effect was independent of the clear finding that participants, based on their self-reported CIP scores, correctly recognized the absence and presence of an overt competition based on their assigned condition.

A 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) ANCOVA on self-reported CIM scores revealed a significant main effect of competitive intergroup relationship, $F(1, 155) = 176.29, p < .001, \eta^2 = .53$, a significant main effect of academic aptitude construal, $F(2, 155) = 13.73, p < .001, \eta^2 = .15$, and a significant interaction between the competitive intergroup

relationship and academic aptitude construal manipulations, $F(2, 155) = 3.47, p = .033, \eta^2 = .04$. As seen in Panel B of Figure 3, participants reported higher CIM scores in the competitive-relationship-present ($M = 5.61$) versus competitive-relationship-absent condition ($M = 2.55$), and pairwise comparisons revealed this tendency occurred across all conditions of academic aptitude construal, $ps < .001$. Pairwise comparisons also revealed that the main effect of academic aptitude on self-reported CIM scores was driven by participants in the low academic aptitude condition having reported significantly lower CIM scores ($M = 3.21$) than their peers in the neutral ($M = 4.48$) and high academic aptitude conditions ($M = 4.55$), $ps < .001$, with CIM scores in the latter two conditions having not differed significantly, $p > .1$. This main effect was qualified by the interaction between competitive intergroup relationship and academic aptitude construal, such that the observed differences between the low versus the neutral and high academic aptitude conditions only occurred among participants in the competitive-relationship-present condition, $ps < .001$, not among participants in the competitive-relationship-absent condition, $ps < .1$.

In sum, the current results suggest that the competitive intergroup relationship and academic aptitude construal manipulations affected self-reported CIP and CIM in qualitatively different ways. The effect of the intergroup relationship on participants' self-reported CIP scores did not depend on the manipulation of academic aptitude, as expected. In contrast, participants who were told they were in competition reported lower levels of CIM when also told the incentive for performing well was weak, and higher levels of CIM when also told the incentive for performing well was strong, as expected. Thus, H2 was generally supported.

Panel A



Panel B

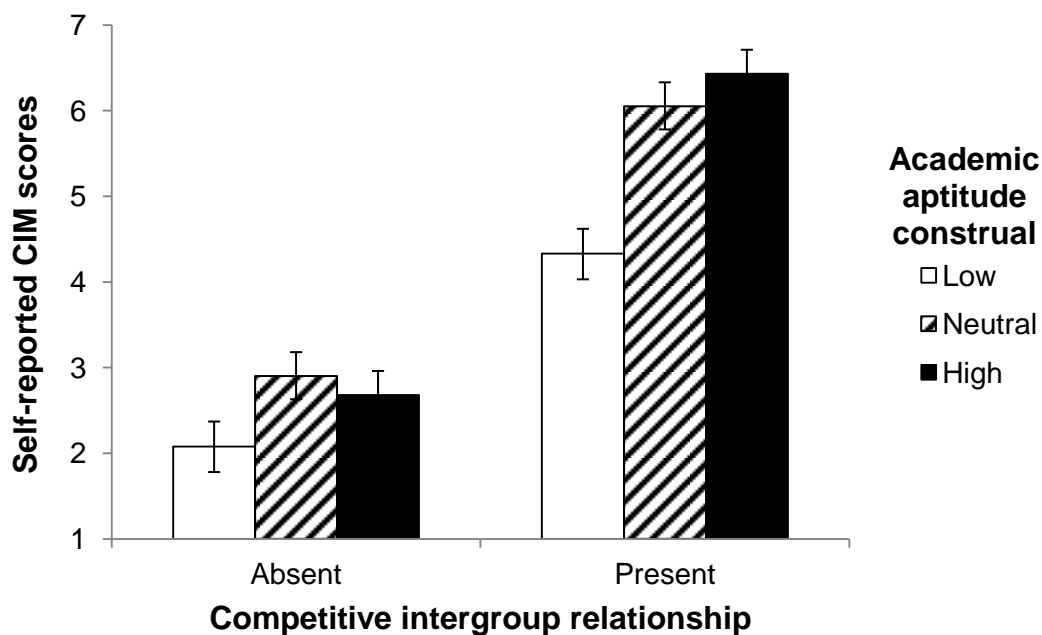


Figure 3. Self-reported CIP (Panel A) and CIM (Panel B) as a function of competitive intergroup relationship (absent, present) and academic aptitude construal (low, neutral, high), Study 3.

H3: CIP and CIM have distinct influences on intergroup behaviour. Recall that the independence and motivational perspectives have divergent predictions about the effects of the competitive intergroup relationship and academic aptitude construal manipulations on discriminatory behaviour in the present study. The independence perspective suggests that relative increases of self-reported CIP and CIM should result in additive increases and decreases of discriminatory behaviour. This corresponds to a main effect of both the competitive intergroup relationship and academic aptitude construal manipulations on discriminatory behaviour, and a non-significant interaction. In contrast, the motivational perspective suggests intergroup discrimination follows primarily from changes in CIM. That is, the level of discriminatory behaviour should be high when participants are told of a competition between the two groups and the incentive for outperforming the other group is strong, but generally low when the incentive for outperforming the other group is weak. This implies a significant interaction between the competitive intergroup relationship and academic aptitude construal manipulations across all measures of intergroup discrimination in Study 3.

These ideas were tested by two 2 x 3 (competitive intergroup relationship [absent, present] x academic aptitude construal [low, neutral, high]) MANCOVAs; one included the total number of points allocated to the ingroup, the outgroup, and the bias in points to the ingroup versus the outgroup as dependent measures; the other included the discriminatory and prosocial behaviour aggregates as dependent measures. Virtually all of the multivariate and univariate main effects of competitive intergroup relationship and academic aptitude construal were significant, such that participants generally discriminated more in the competitive-relationship-present versus the competitive-

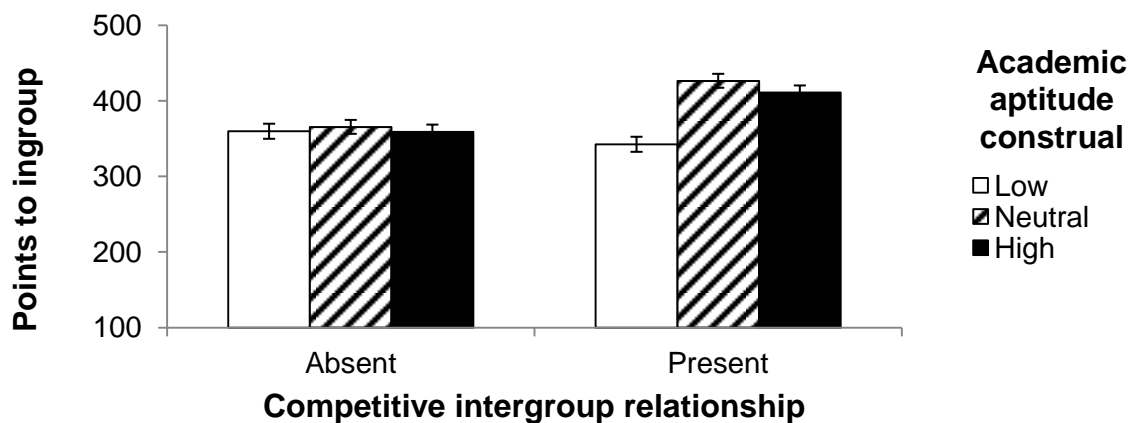
relationship-absent condition, and in the neutral and high academic aptitude conditions versus the low academic aptitude condition¹¹. Each of these effects were qualified by significant multivariate and univariate interactions, $F_s = 3.27 - 10.36$, $p_s < .05$, $\eta^2_s = .04 - .12$. For brevity, only the pairwise comparisons with Bonferroni corrections are detailed below.

Point allocation measures. Participants' tendencies for polarized point allocations to the ingroup and outgroup were most pronounced only when a competitive intergroup relationship was present and when the performance task was construed as reflecting neutral or high academic aptitude (Figure 4). The amount of points given to the ingroup was relatively low and did not differ as a function of academic aptitude construal when a competitive intergroup relationship was absent, $p_s > .1$, and the amount given to the ingroup when a competitive intergroup relationship was absent or present did not differ when the task was described as reflecting low academic aptitude, $p > .1$. In contrast, when a competitive relationship was present, participants in the neutral and high academic aptitude conditions gave more points to the ingroup than participants in the low academic aptitude condition, $p_s < .001$ (Panel A of Figure 4). Similarly, participants gave the most amount of points to the outgroup when a competitive relationship was absent regardless of the academic aptitude construal condition, $p_s > .1$, and they were equivalently giving across both of the competitive intergroup relationship conditions when the performance task reflected low academic aptitude, $p > .1$; however, when a competitive relationship was present, participants gave fewer points to the outgroup when

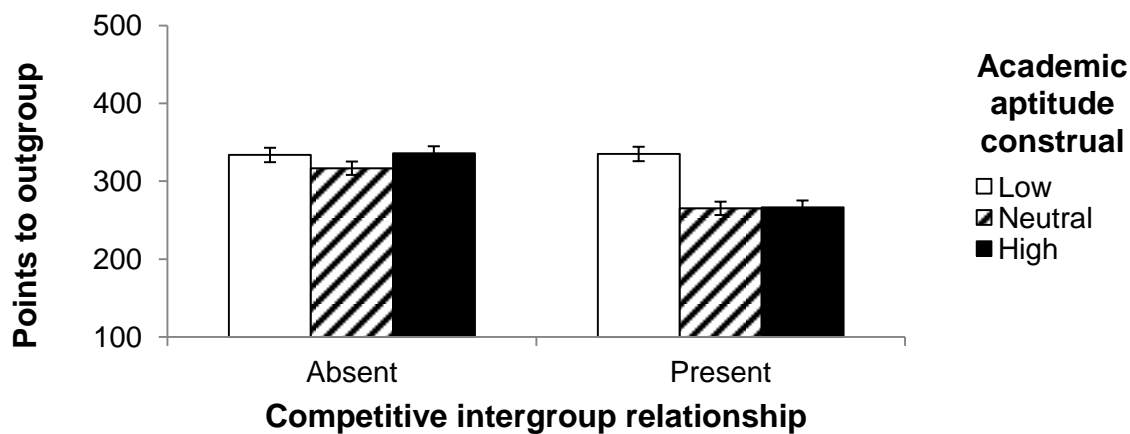
¹¹ In these analyses the only main effect that was not significant was the effect of academic aptitude construal on prosocial behaviour, $F(2, 155) = 1.87$, $p > .1$. The multivariate and univariate main effects of competitive intergroup relationship and academic aptitude construal on all other criterion variables were significant, $F_s = 5.43 - 30.54$, $p_s < .001$, $\eta^2_s = .07 - .17$.

the performance task was also framed as reflecting a neutral or high academic aptitude than when the performance task reflected low academic aptitude, $ps < .001$ (Panel B of Figure 4). A consistent pattern of results was observed for the bias in points allocated to the ingroup versus the outgroup, such that these biases were relatively low across all academic aptitude conditions when a competitive relationship was absent, $ps > .1$, and across both intergroup relationship conditions when CIM was low, $p > .1$, but the observed biases were stronger among participants in the competitive-relationship-present/neutral academic aptitude and competitive-relationship-present/high academic-aptitude cells compared with participants in the competitive-relationship-present/low academic aptitude cell, $ps < .001$ (Panel C of Figure 4).

Panel A



Panel B



Panel C

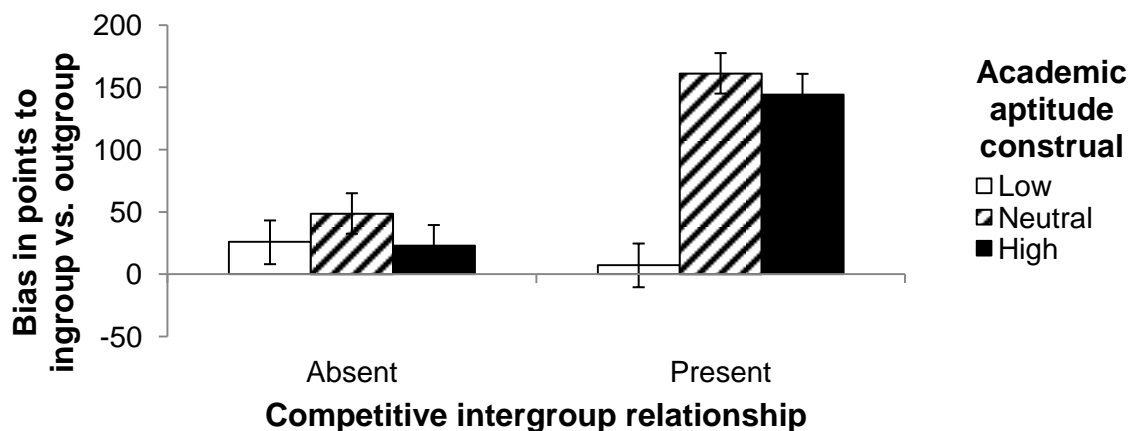


Figure 4. Total point allocation to the ingroup (Panel A), outgroup (Panel B), and bias in points to the ingroup versus the outgroup (Panel C) as a function of competitive intergroup relationship (absent, present) and academic aptitude construal (low, neutral, high), Study 3.

Discriminatory and prosocial aggregate measures. The discriminatory and prosocial aggregate results parallel those found for the point allocation measures and are displayed in Figure 5. Participants engaged in relatively less discriminatory behaviour when a competitive relationship was absent regardless of the academic aptitude construal, $ps > .1$, and the presence versus the absence of a competitive relationship did not increase discriminatory behaviour when the performance task was depicted as reflecting low academic aptitude, $p > .1$. In contrast, when a competitive relationship was present, participants in the neutral and high academic aptitude conditions engaged in more discrimination than participants in the low academic aptitude condition, $ps < .001$ (Panel A of Figure 5). Similarly, participants engaged in more prosocial behaviour towards the outgroup when a competitive relationship was absent across all academic aptitude construal conditions, and the presence versus the absence of a competitive relationship did not reduce prosocial behaviour when the performance task reflected low academic aptitude, $p > .1$. When a competitive relationship was present, participants in the neutral and high academic aptitude conditions engaged in less prosocial behaviour than participants in the low academic aptitude condition, $p = .074$ and $p = .013$, respectively (Panel B of Figure 5).

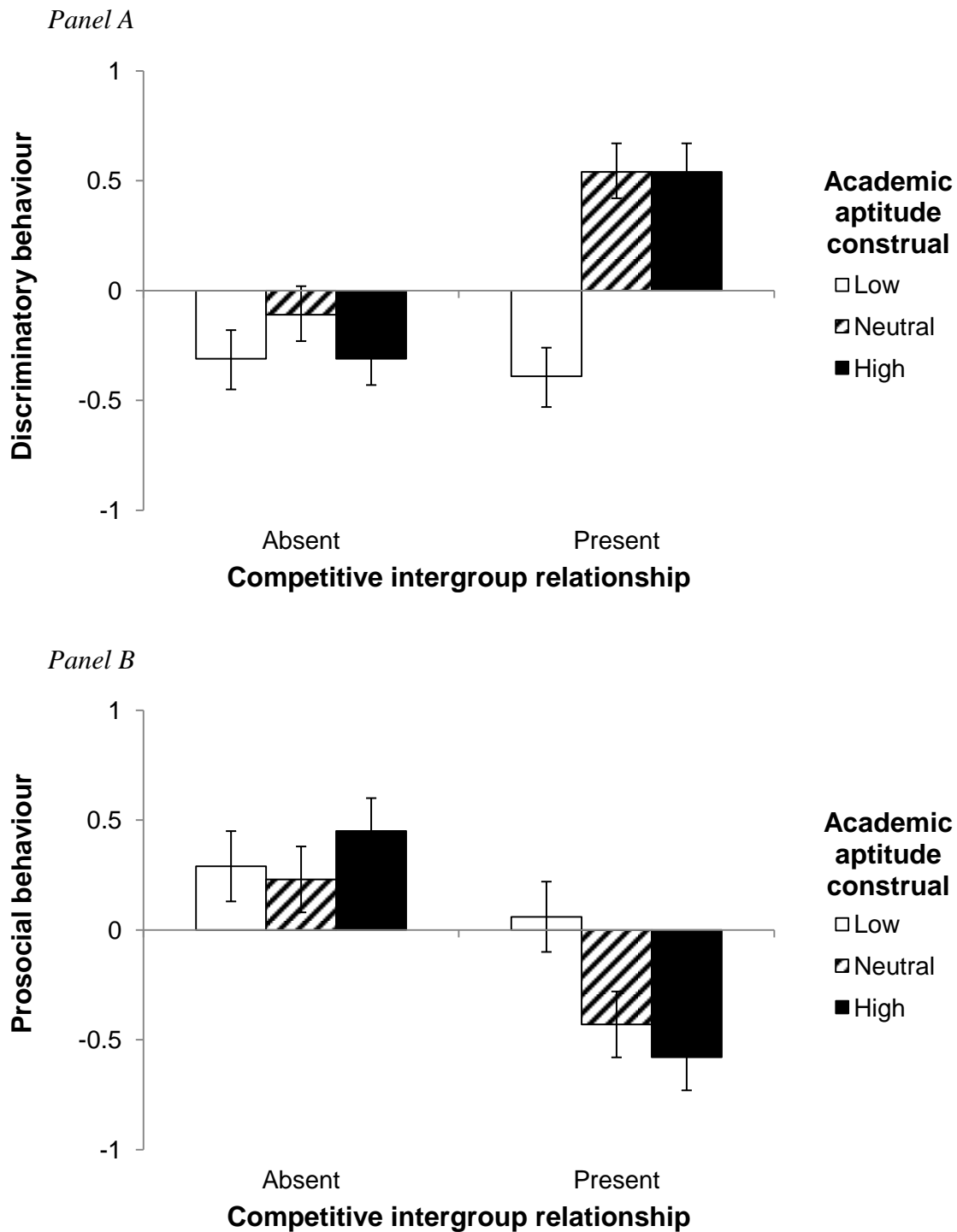


Figure 5. Discriminatory (Panel A) and prosocial (Panel B) behaviour as a function of competitive intergroup relationship (absent, present) and academic aptitude construal (low, neutral, high), Study 3.

Correlational and mediation results. The motivational perspective suggests that perceived intergroup competition will only lead to outgroup discrimination when participants are strongly motivated to compete on behalf of their ingroup. This implies the presence of mediated moderation, such that the significant interactions in the current study are mediated by participants' self-reported levels of CIM. Because the interaction of competitive intergroup relationship and academic aptitude construal also predicted the perceived status of the ingroup relative to the outgroup, it is also important to determine whether the observed interactions were mediated by perceived status rather than self-reported CIM scores.

The nature of the observed interactions was that (more) discriminatory and (less) prosocial behaviour emerged only when a competitive intergroup relationship was present and the performance task reflected neutral or high academic aptitude. To represent this interaction, an effect code was created for the manipulation of the competitive intergroup relationship (CIR: -1 = absent; 1 = present) and two post hoc contrast coefficients were created to reflect the observed effect of academic aptitude construal; the first contrasted the low and neutral academic aptitude construal conditions (AAC₁: -1 = low; 1 = neutral; 0 = high) and the second contrasted the low and high academic aptitude conditions (AAC₂: -1 = low; 0 = neutral; 1 = high). Two interaction terms were created by multiplying the CIR effect code by each academic aptitude contrast coefficient. For the mediation analyses, Preacher & Hayes' (2008) macro was used in separate sets of analyses for each of the criterion variables. Each set consisted of two analyses that entered ingroup identification, hypercompetitiveness, the effect code of competitive intergroup relationship and both of the academic aptitude construal contrast

coefficients as covariates, with self-reported perceived status (a_1b_1) and CIM (a_2b_2) as potential mediators. One analysis in a given set entered the interaction term of competitive intergroup relationship with the first academic aptitude contrast coefficient (i.e., low vs. neutral) as the independent variable, and the other analysis in the set entered the interaction term of competitive intergroup relationship with the second academic aptitude contrast coefficient (i.e., low vs. high) as the independent variable. The regression coefficients and confidence intervals from each analysis were derived from a sampling distribution of 5000 iterations. Following the motivational perspective, it was expected that self-reported CIM scores would mediate the relation between the given interaction term and the criterion variable in both analyses of each set.

The results of the mediation analyses are displayed in Table 13. The effect of the interaction of competitive intergroup relationship by the contrast of the low versus neutral academic aptitude conditions ($CIR \times AAC_1$) on the criterion variables was virtually unchanged across all analyses when the mediators were included, and the specific mediation effects of self-reported perceived status and CIM for this interaction were never significantly different from zero. This suggests that the relatively high levels of outgroup discrimination observed among participants who were told there was a intergroup competition and that performing well on the performance task was unrelated to academic achievement was not mediated by self-reported CIM or perceived status. In contrast, the effects of the interaction of competitive intergroup relationship by the contrast of the low versus high academic aptitude conditions ($CIR \times AAC_2$) on the criterion variables were always rendered weaker when the mediators were included. In these analyses, the specific mediation effects for perceived status were never significant,

and the mediation effects for self-reported CIM scores were always significant. This suggests that the relatively high levels of outgroup discrimination observed among participants who were told there was an intergroup competition and that the performing well on the performance task reflected strong academic achievement was mediated by self-reported CIM, as expected by the motivational perspective.

In sum, the mediation analyses provided partial results for the motivational perspective, such that self-reported CIM scores did not mediate the effects of the interaction between competitive intergroup relationship and academic aptitude construal on discrimination among participants who were told they were in competition in the neutral academic aptitude condition, but self-reported CIM scores did mediate the effects of the interaction for participants who were told they were in competition in the high academic aptitude condition.

Table 13

Mediated Moderation Effects on Criterion Variables in Study 3

Criterion variables	R ²	c	c'	Self-reported Perceived status			Self-reported CIM		
				a ₁ b ₁	LL	UL	a ₂ b ₂	LL	UL
Total points to ingroup									
CIR x AAC ₁	.41	2.69**	2.66**	.28	-1.79	2.80	.76	-3.93	6.15
CIR x AAC ₂	.41	1.82†	1.05	-.17	-1.93	1.65	4.70*	.85	9.59
Total points to outgroup									
CIR x AAC ₁	.40	-1.15	-.94	-.70	-3.53	1.72	-.47	-3.70	2.33
CIR x AAC ₂	.40	-2.91**	-2.44*	.51	-1.26	3.04	-2.98*	-6.54	-.48
Bias in points to ingroup vs. outgroup									
CIR x AAC ₁	.45	2.14*	2.01*	.93	-3.19	5.83	1.11	-5.70	8.92
CIR x AAC ₂	.45	2.57*	1.92†	-.70	-4.51	2.63	7.59*	1.19	15.39
Discriminatory behaviour									
CIR x AAC ₁	.36	2.67**	2.31*	.00	-.04	.02	.03	-.01	.10
CIR x AAC ₂	.37	3.51***	2.74**	.00	-.02	.01	.06*	.02	.12
Prosocial behaviour									
CIR x AAC ₁	.29	-1.27	-1.07	.02	-.01	.07	-.03	-.10	.01
CIR x AAC ₂	.30	-2.56*	-1.81†	-.01	-.04	.01	-.06*	-.13	-.01

Note. c = effect of interaction on the criterion variable. c' = effect of interaction on the criterion variable after including self-reported perceived status and CIM as mediators. a_ib_i = unstandardized estimate of mediated effect. LL = Lower limit of Bias-corrected 95%

CI. UL = Upper limit of Bias-corrected 95% CI. CIR = competitive intergroup relationship (-1 = absent; 1 = present). AAC₁ = academic aptitude construal (-1 = low; 1 = neutral; 0 = high). AAC₂ = academic aptitude construal (-1 = low; 0 = neutral; 1 = high). Significant mediation effects are in boldface. *** $p < .001$; ** $p < .01$; * $p < .05$, † $p < .1$.

Discussion

The results of Study 3 supported the current conceptual framework that distinguishes CIP and CIM as related but distinct constructs. Although they were both strongly related to each other, self-reported CIM was not affected by the experimental manipulations in all of the same ways as self-reported CIP. That is, participants clearly recognized whether a competition between their ingroup and the outgroup was absent or present, but this did not entirely colour their competitive motivations. Rather, participants who were told they were competing on a performance task with little intrinsic value for success reported lower levels of CIM than participants who were told they were competing on a performance task with ambiguous or high intrinsic value for success. Thus, the present study supported the current conceptual framework, and conceptually replicated the results of Study 2, by demonstrating that it is possible to produce distinct levels of CIP and CIM within the same study.

Study 3 also generally supported the idea that CIP and CIM had distinct effects on intergroup behaviour. The main effects from the MANCOVA analyses suggest that experimentally-induced increases in CIP and CIM resulted in roughly corresponding increases in intergroup discrimination. Moreover, these changes were qualified by the interaction between the competitive intergroup relationship and academic aptitude construal manipulations. Not all participants who were presented with a salient intergroup

competition engaged in discriminatory behaviour; participants who were given a weak incentive for strong performance showed no difference in their level of discrimination from participants who were explicitly told they were not in competition. The greatest levels of outgroup discrimination were displayed by those participants who were in competition and who were also given an intrinsically neutral or strong incentive for performing well on the performance task. In addition, self-reported CIM scores partially mediated the effect of the predicted CIP x CIM interaction on discriminatory behaviour among those participants who were in competition and were given a strong incentive for performance.

With regard to understanding how and when intergroup competition relates to discrimination, similar to Studies 1 and 2, the present study offered no support to the independence perspective and provided mixed support of the motivational perspective. An independence perspective would suggest the experimental manipulations would have resulted in additive, non-interactive effects on self-reported CIP and CIM, and in turn, discriminatory behaviour, but this was not found. The predictions from the motivational perspective, that the strongest levels of self-reported CIM and discrimination would only be observed in a situation where there is a strong incentive to successfully compete on behalf of one's group, and that CIM would operate as the mediator of discriminatory behaviour, were partially supported. That is, these expectations were largely realized among the participants who were told they were in competition over a strong incentive, but not among participants who were told they were in competition over a neutral incentive. Participants in the latter condition reported higher CIM levels than expected, and their heightened discriminatory behaviour was not mediated by self-reported CIM.

The present study also showed that experimentally-induced changes in CIM did not affect participants' tendency to discriminate on behalf of their group when CIP was absent, which is not consistent with the motivational perspective or the results of Study 2. In sum, these results collectively suggest that CIM has a substantial and prominent role in fomenting intergroup discrimination, and that more overt or hostile forms of discrimination likely depend on high levels of both CIP and CIM.

General Discussion

The current set of studies demonstrates the value of conceptually and empirically distinguishing between competitive intergroup perceptions (CIP) and competitive intergroup motivations (CIM) in potentially competitive group settings. The distinction between CIP and CIM proposed in the current conceptual framework yielded three hypotheses that were generally supported in each study. As predicted in Hypothesis 1, CIP and CIM were positively related, and the magnitudes of their partial correlations and proportion of shared variance in each study did not indicate that they were redundant with each other. In particular, Studies 2 and 3 showed that targeted experimental manipulations could differentially affect self-reported CIP and CIM. It was observed in Study 2 that a description of a performance task as a measure of academic versus perceptual skills did not affect self-reported CIP but resulted in higher levels of self-reported CIM. In Study 3, high levels of self-reported CIP were uniformly observed among participants who were explicitly told the group context was competitive versus non-competitive, and this effect was independent of the academic aptitude construal manipulation. In contrast, high levels of self-reported CIM were only observed among those participants who were explicitly told the group context was competitive *and* that the incentive for group success was

either neutral or strong. These results further support the current framework's distinction of CIP and CIM by showing that both variables may be uniquely affected by different causal agents or antecedents, in line with Hypothesis 2. Finally, the current research affirmed the value of distinguishing between CIP and CIM by showing that both variables were distinctly related to discriminatory outgroup intentions and behaviour in each study, providing strong evidence for Hypothesis 3.

The results of all three studies suggest that CIM had a particularly critical influence on discriminatory or prosocial behaviour toward the outgroup. In Studies 1 and 2, CIM, rather than CIP, was positively and negatively associated with discriminatory and prosocial intentions and behaviour toward the outgroup, respectively. Study 2 further demonstrated that an experimental manipulation which increased CIM but not CIP resulted in a reduced tendency to engage in prosocial behaviour toward the outgroup. Study 3 showed that participants engaged in greater discriminatory and less prosocial behaviour only when a competitive intergroup relationship was present and the incentive for one's group to perform well was stronger, but not when a competitive relationship was absent, or when a competitive relationship was present and the incentive for one's group to perform well was weak. These results contradict the additive contributions of CIP and CIM to intergroup discrimination predicted by the independence perspective, and are most in line with the primary role of CIM in eliciting discrimination posited by the motivational perspective.

The predictions for the motivational perspective were not always supported or entirely consistent, however. Although CIM was more strongly related to discriminatory intentions and behaviour in Studies 1 and 2, the experimentally-induced increase of self-

reported CIM in Study 2 did not result in the expected increases across all indicators of discriminatory behaviour. Rather, this manipulation only resulted in a moderate reduction of prosocial outgroup behaviour, and this effect was also not replicated in Study 3. The idea that strong, salient levels of CIP will only lead to high levels of intergroup discrimination when CIM is also strong was supported in Study 3, but not Study 1; rather, the tendency for self-reported CIM to be associated with greater discriminatory intentions in Study 1 was stronger when participants also reported high levels of CIP. The mediation results in Studies 2 and 3 were also not completely consistent with the motivational perspective. The observed effects of the academic aptitude construal manipulation on outgroup behaviour in Study 2 were not always mediated by self-reported CIM, and the effects of the interaction between the intergroup relationship and academic aptitude manipulations on discriminatory behaviour in Study 3 were partially, but not fully mediated by self-reported CIM.

These results collectively suggest that a certain level of synergy between CIP and CIM is necessary for strong levels of intergroup discrimination. It was observed across all three studies that higher levels of CIP did not lead to discriminatory intentions or intergroup discrimination when CIM levels were low. Similarly, experimentally-induced increases in CIM did not result in very hostile or aggressive forms of discrimination when CIP levels were low. These results can be described as supporting a “minimal motivation threshold” perspective which suggests that CIP will not lead to intergroup discrimination when CIM is weak or inactive, but that CIM requires the salience of CIP to justify strong discriminatory behaviour. Thus, participants in the current studies may not have been prepared to engage in hostile forms of discrimination based upon the mere recognition of

a competitive context that involved their group, nor were they eager to aggressively discriminate against the outgroup when they were presented with only a relatively strong incentive for superior group performance.

Implications

The distinction of CIP and CIM in the current framework was based on prior construct definitions and operationalizations from the literature on competitive intergroup dynamics and other relevant lines of research on competition. The theoretical paradigms of social interdependence theory and RGCT have typically relied on situational definitions of competition, with the implicit assumption that the participants would recognize a competitive goal structure and believe others would compete accordingly. This perception is reflected in the measurement of CIP in the current research. SIT and other research on relevant individual difference variables such as SDO assume, and have shown that chronic or contextual needs for a positive group identity and/or a dominance hierarchy between groups are implicated in a wide range of discriminatory behaviours. The assessment of these needs correspond closely to the measurement of CIM in the current research. Thus, the current conceptual framework can be described as an approach that has integrated certain aspects of these related, but distinct paradigms to gain more precise insights of when intergroup competition produces outgroup discrimination.

The current research consistently found that stronger levels of discriminatory intentions and behaviour toward the outgroup were observed only when self-reported CIP and CIM levels were both high. This suggests that those studies which observed that the presence of competitive versus non-competitive group contexts did not result in

corresponding increases in discriminatory behaviour (e.g., Brewer & Silver, 1978; Brown, 1984; Jetten, Spears, & Postmes, 2004) may not have elicited sufficiently strong levels of CIM. This explanation is plausible, considering that each of these findings are from studies that used the minimal-groups design and the competition may not have been highly motivating to the participants involved. This explanation is also consistent with the fact that many studies which have observed heightened intergroup bias and discrimination as a function of perceived competition (e.g., Jackson & Esses, 2000; Stephan et al., 2005; Struch & Schwartz, 1989) typically included a highly appealing or self-relevant incentive (e.g., political power, economic prosperity).

At a broader theoretical level, the results of these studies are not entirely consistent with RGCT. It was observed that stronger incentives or levels of CIM were associated with greater intergroup discrimination, which is consistent with the predicted correlation between the degree of threat and the degree of hostility proposed by RGCT (Campbell, 1965); however, none of the studies in the current research used monetary incentives or tangible conflicts of interests between the groups involved. The fact that the linear increase in incentive appeal in the low, neutral, and high academic aptitude conditions of Study 3 did not translate into correspondingly linear increases in self-reported CIM and intergroup discrimination among those participants in competition is also inconsistent with RGCT. These results were more consistent with SIT, such that the potential to secure a positive social identity by helping other ingroup members gain an advantage on an academic performance task tended to elicit higher levels of CIM and discriminatory behaviour in Studies 2 and 3. The fact that much of the discrimination in Studies 2 and 3 was mediated by CIM rather than ingroup identification suggests that this

behaviour appears to have been rooted in the desire for a *superior* group identity, rather than the drive for a merely positive group identity as suggested by SIT. The intangible desire for a superior social identity may also explain why participants who were told they were in a competition over a more neutral, perceptual task in Study 3 still displayed levels of CIM and intergroup discrimination that were higher than expected. Competitive situations likely offer intrinsically motivating opportunities for social comparison (Buunk & Gibbons, 2007; Festinger, 1954) and self-enhancement (Alicke & Sedikides, 2009) over and above any immediate utilitarian gains from winning.

The proposed distinction between CIP and CIM may, therefore, be instrumental in providing a greater understanding of when intergroup competition leads to intergroup hostility. The framework behind the current research proposed that our understanding of the effects of intergroup competition was incomplete, partially because much of the insights in this area are based on studies that relied on situational definitions and manipulations of intergroup competition and did not systematically assess how participants ascribed meaning from these situations. Studies 1 and 2 in particular demonstrated that objectively neutral situations which did not formally institute competition between groups could still trigger relatively high levels of self-reported CIM that predicted discriminatory intentions and behaviour, and Study 3 demonstrated how self-reported CIM and CIP levels and discriminatory behaviour can be uniquely affected by different combinations of experimental manipulations. In this way, focusing on the meaning that was evoked from a potentially competitive situation led to novel insights on the nature of competitive group dynamics, as well as how and when competition led to harmful intergroup behaviour. These findings, therefore, have important implications for

potentially competitive intergroup settings or contexts of intergroup conflict, and warrant further research and scrutiny.

Limitations & Critiques

A potential concern with the current research is the artificial nature of the group context in each study. Studies 1 and 2 used a minimal-group-paradigm based on an apparent dichotomy of thinking styles, and Study 3 was based on a supposedly joint project between two universities. It is possible that the results observed from these contexts would not generalize outside the laboratory to contexts that involve more salient and self-relevant group memberships (e.g., one's ethnicity, religion, geographic region). It is also typical that in "real-life" between-group dynamics, one's ingroup may occupy an objectively or subjectively subordinate or dominant status compared with the other group(s), unlike the group contexts in the current studies. People are sensitive to the nature and stability of their group's relative status, and may act in a more discriminatory or acquiescent manner toward outgroups as a result (Bettencourt, Charlton, Dorr & Hume, 2001; Ouwerkerk, Gilder, & de Vries, 2000; Scheepers et al., 2006a).

The impetus for the current framework is partially rooted in the goal of understanding the nature of intergroup processes more precisely. Because the current research is the first to investigate this framework, it was desirable to assess the influence of competitive group dynamics in contexts in which the group categories were not already heavily stereotyped, associated with specific emotion- or value-laden reactions, or identified according to their relative status. The current research may therefore be used as a baseline against future endeavours that assess CIP and CIM in more real-world contexts.

A more conceptual critique could be raised about the current conceptual framework's distinction between CIP and CIM. Although both variables may have distinct antecedents and outcomes, it may be very difficult, in practice, to independently assess their unique influences, considering they are strongly related and likely affect each other. The distinction between CIP and CIM is analogous to the distinction between cognition and affect or cognition and motivation, and there is an unreconciled debate over whether to separate the two components or consider them as one (Alicke & Sedikides, 2009; Andersen, 1995; Charland, 2005; Lazarus, 1991, 1999). Researchers who adopt a dynamist viewpoint would likely suspect that it would be optimal to consider CIM as a type of cognition, perception, or attribution (Anderson & Slusher, 1986; Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002), and that it is phenomenologically impossible to demarcate perceptions from motivations (Tetlock & Levi, 1982).

It is noteworthy that other research has used the distinction between cognition and motivation, or cognitive versus affective properties to understand people's attitudes toward other groups (Guimond & Dubé-Simard, 1983; Mackie & Smith, 1998), general tendencies toward specific outgroups (Cuddy, Fiske, & Glick, 2007), willingness to engage in intergroup contact (Esses & Dovidio, 2002), and prejudice reduction following intergroup contact (Paolini, Hewstone, & Cairns, 2007). In the current research, Studies 2 and 3 elicited distinct patterns of results in self-reported CIP and CIM levels. The current studies also showed that discriminatory intentions and behaviour were predicted by CIM rather than CIP in Studies 1 and 2, and that discriminatory behaviour was more strongly associated with changes in CIM than CIP in Study 3. Although the design and results of

the current studies cannot resolve the broader issue of whether and how to demarcate perceptions from motivations, it may be sufficient, for the time being, to conceive of CIP and CIM as related processes that have distinct *properties* (i.e., unique antecedents and outcomes; see also Kruglanski et al., 2002).

The narrative from the current research is not yet complete, therefore. The ability to differentially manipulate CIP and CIM would be more convincing if the results of Studies 2 and 3 were replicated with different group contexts. The current research would also benefit from using different methods to manipulate motivation, such as the degree to which a performance task is diagnostic of a single self-relevant important skill set, or varying the degree to which participants are categorized as ingroup members (Gaertner & Insko, 2000). There are also other plausible perspectives on the relation between intergroup competition and discrimination that were not examined in the current research.

Future Research Directions

It is possible that participants may have formed and acted on the idea of a competitive intergroup norm, such that they felt obligated to compete because they believed other ingroup and outgroup members were also behaving in a competitive fashion. Louis and her colleagues (Louis et al., 2007; Louis, Taylor, & Douglas, 2005; Nickerson & Louis, 2008) have shown people often respond in a prosocial or discriminatory manner to other societal outgroups in a manner that is consistent with their perceived familial or societal norms. Jetten and her colleagues (Jetten et al., 1996; Jetten, Spears, & Manstead, 1997; Jetten et al., 2006) have experimentally varied discriminatory and fairness norms by presenting participants with fictional comments of other group members engaging in discriminatory or prosocial outgroup behaviours, and have

observed that participants' subsequent behaviour often followed the salient norm. Manipulating intergroup norms in this way could easily be combined with the methods in the current research of manipulating CIP and CIM, and such research would help to rule out a normative perspective and also determine how norms themselves contribute to motivational and perceptual processes in competitive intergroup contexts.

It may also be that the lack of overt, aggressive discrimination in Study 2 and the stronger levels of discrimination in Study 3 emerged because participants in the latter study saw the competition as organized from legitimate institutional authorities. People are more likely to trust institutions and other persons that are imbued with legitimacy (Tyler, 2006). In other research on intergroup contexts, participants have engaged in aggressive acts toward a relevant outgroup (Jetten et al., 2000; Miller, Roberts, & Ommundsen, 2005) or tolerated discriminatory behaviour from an outgroup (Jetten, Schmitt, Branscombe, Garza, & Mewse, 2011) if it was seen as legitimate and appropriate. Future research can investigate if perceived institutional legitimacy constitutes the minimal basis by which highly motivated individuals would engage in aggressive discriminatory behaviour, and if any such effects are tempered or augmented by salient intergroup norms.

Beyond the normative and legitimacy perspectives, the distinction between CIP and CIM can also be easily and productively used within other theoretical or conceptual paradigms. For example, measures of CIP and CIM can be administered as mediator variables to determine which of these variables is most prominent in the emergence of outgroup prejudice and discrimination within those studies that examine the effects of group identification, status, or stability in the style of SIT. The current framework may

also inform the accounts of intergroup dynamics as described by other contemporary intergroup relations theories. Intergroup threat theory, for example, suggests that perceptions of realistic or symbolic threats typically predict prejudice toward the target group(s) in question. The findings from Studies 1-3 suggest that the *perception* of resource- or symbolic value-related threats may not be as instrumental in generating prejudice as the corresponding *motivation* to acquire more resources, or a more dominant status relative to the outgroup.

The current framework may also be used to examine other important research questions. Researchers are increasingly examining how intergroup processes may vary according to the type of group(s) involved, or the function of the group(s) to the individual member (Brown, 2000). Research that has asked participants to rate and classify large numbers of common group categories according to a variety of features has shown that people's relationships to their groups were often distinguished in terms of their vocation or task-relevance, ethnicity or religion, personal or familial, and other temporary, miscellaneous categories (Deaux, Reid, Mizrahi & Ethier, 1995; Lickel, Hamilton, Wierzchowska, Lewis, Sherman, & Uhles, 2000). This research also revealed that participants also tended to attribute specific properties, functions, or relational and interaction schemas to groups based on their relationship type (see also Cuddy, Fiske, & Glick, 2007; Fiske, Cuddy, Glick, & Xu, 2002). It is plausible, therefore, that certain types of ingroup or outgroup categorizations may elicit differing levels of CIP and CIM, which may help our understanding of why some competitive group contexts trigger high levels of hostility and aggression while others do not.

It would also be informative to clarify the role of outcome interdependence in competitive intergroup contexts. Outcome interdependence is often described as a qualifying feature in definitions of competitive situations (see Table 1), and the perception of conflicting group interests is a root cause of intergroup hostility, according to RGCT. Perceptions of outcome interdependence may explain why an experimental increase of CIM in the absence of a competitive intergroup relationship affected intergroup behaviour in Study 2, but not in Study 3: participants in the latter study were told that the points (feedback opportunities) they assigned would affect participants in a future session, while participants in the former study were told their point allocation decisions would directly affect the ingroup and outgroup members in their current session.

The idea that perceptions of outcome interdependence are necessary for intergroup discrimination and hostility is not easily reconcilable with the results of the current studies overall, however. In Study 2, the salience of a highly self-relevant task led participants to engage in less prosocial behaviour toward outgroup members, even though they were told the two groups were not in competition. Participants in Study 3 discriminated against outgroup members in a future session, even though these individuals could not affect the design or outcomes of the performance task participants would complete in their current session. This suggests that the desire to outperform the outgroup, or the desire for a superior group identity may have more of an impact on intergroup discrimination than the perception of outcome interdependence. This implies the intriguing possibility that people who are primed with a desire to outmatch an outgroup may engage in competitive or discriminatory behaviour, even if a competition

has not been staged or is actively discouraged. This is consistent with some research in which people who were primed with a competitive mindset reported greater prejudice toward outgroups that were not involved in the original context (Sassenberg et al., 2007). The perception of outcome interdependence and the desire for a superior group identity should therefore be examined in future studies, and may inform other research on the effects of priming competitive (or comparative) versus cooperative or individualistic mindsets (e.g., Anderson & Morrow, 1995; Dru, 2007; Golec & Federico, 2004; Kawada, Oettingen, Gollwitzer, & Bargh, 2004; Mummendey, Klink, & Brown, 2001).

Systematically examining the role of CIP and CIM within each of these theoretical paradigms and research questions could offer numerous insights, which could subsequently be applied more broadly to social issues that have immediate practical benefit. Competitive group dynamics have been implicated in a wide range of perceptual, evaluative and behavioural processes, including outgroup emotions (Cottrell & Neuberg, 2005; Smith, Seger, & Mackie, 2007) prejudice (Duckitt, 2006; Esses, Jackson, & Armstrong, 1998; Jackson, 1993; Stephan et al., 2005), experiencing pleasure over outgroup failures (Cikara, Bruneau, & Saxe, 2011; Leach & Spears, 2008), voting intentions and behaviour (Louis et al., 2007; Struch & Schwartz, 1989), negotiations (Drolet & Morris, 2000; De Dreu & Nijstad, 2008; Diekmann, Tenbrunsel, & Galinsky, 2003; Grant, 1991), aggression (Cikara, Botvinick, & Fiske, 2011; Federico, Golec, & Dial, 2005; Halperin, 2011; Thomsen, Green, & Sidanius, 2008; Wagner & Christ, 2007), genocide (Schutte & Kessler, 2007; Staub, 2000), the denial or downplay of past ingroup atrocities (Noor, Shnabel, Halabi, & Nadler, in press; Roccas, Klar, & Liviatan, 2006), and to some extent, consumer judgments and decision-making (Briley & Wyer Jr., 2002;

Durvasula & Lysonski, 2006; Shimp & Sharma, 1987). Applying the current framework would provide greater insight on the role of competitive processes within each of these areas.

Conclusions

The current research was undertaken to assess the utility of a new conceptual framework to assess the operation and social consequences of competitive intergroup dynamics. Because the intergroup relations literature currently includes multiple definitions and operationalizations of intergroup competition as well as inconsistent effects of intergroup competition on discrimination across studies, it was proposed that conceptualizing intergroup competition as appraisals of competitive intergroup perceptions (CIP) and competitive intergroup motivations (CIM) was preferable to the more conventional approach of defining intergroup competition in terms of situational parameters. This framework yields empirically falsifiable hypotheses regarding the distinction between CIP and CIM that were examined and largely supported in the current research.

With regard to the central question of when and how intergroup competition leads to intergroup discrimination and hostility, the current research is among the first to systematically examine and distinguish the influence of competitive perceptions versus competitive motivations. This research was an initial, but not fully exhaustive review of how CIP and CIM contribute to discriminatory behaviour. It provided an empirical rationale for applying the proposed framework to examine the role of competition in contexts of intergroup conflict and hostility, which may generate more thorough insights on the processes and social consequences of competitive group dynamics. For the time

being, the current research suggests the question of when intergroup competition leads to intergroup discrimination depends, to some extent, on the degree to which the participants involved are actually motivated to perform better and/or acquire more on behalf of their ingroup.

References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA, US: Sage Publications, Inc.
- Akimoto, S. A., Sanbonmatsu, D. M., & Ho, E. A. (2000). Manipulating personal salience: The effects of performance expectations on physical positioning. *Personality and Social Psychology Bulletin*, 26(7), 755-755.
- Alicke, M. D., & Sedikides, C. (2009). Self-enhancement and self-protection: What they are and what they do. *European Review of Social Psychology*, 20, 1-48.
- Altemeyer, B. (1996). *The authoritarian specter*. Cambridge, MA: Harvard University Press.
- Amiot, C. E., & Bourhis, R. Y. (2003). Discrimination and the positive-negative asymmetry effects: Ideological and normative process. *Personality and Social Psychology Bulletin*, 29(5), 597-608.
- Amiot, C. E., & Bourhis, R. Y. (2005). Ideological beliefs as determinants of discrimination in positive and negative outcome distributions. *European Journal of Social Psychology*. Special Issue: In Honour of Ken Dion, 35, 581-598.
- Anderson, C. A., & Morrow, M. (1995). Competitive aggression without interaction: Effects of competitive versus cooperative instructions on aggressive behavior in video games. *Personality and Social Psychology Bulletin*, 21(10), 1020-1030.
- Anderson, C. A., & Slusher, M. P. (1986). Relocating motivational effects: A synthesis of cognitive and motivational effects on attributions for success and failure. *Social Cognition*, 4(3), 270-292.

- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.
- Bar-Tal, D., Kruglanski, A. W., & Klar, Y. (1989). Conflict termination: An epistemological analysis of international cases. *Political Psychology, 10*(2), 233-255.
- Beaton, A. M., & Tougas, F. (1997). The representation of women in management: The more, the merrier? *Personality and Social Psychology Bulletin, 23*(7), 773-782.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). New York: Academic Press.
- Bettencourt, B. A., Charlton, K., Dorr, N., & Hume, D. L. (2001). Status differences and ingroup bias: A meta-analytic examination of the effects of status stability, status legitimacy, and group permeability. *Psychological Bulletin, 127*(4), 520-542.
- Bonta, B. D. (1997). Cooperation and competition in peaceful societies. *Psychological Bulletin, 121*, 299-320.
- Bourhis, R. Y., Sachdev, I., & Gagnon, A. (1994). Intergroup research with the Tajfel matrices: Methodological notes. In M. P. Zanna, & J. M. Olson (Eds.), (pp. 209-232). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc.
- Brehm, J. W. (1999). The intensity of emotion. *Personality and Social Psychology Review, 3*, 2-2.
- Brehm, J. W., & Self, E. A. (1989). The intensity of motivation. *Annual Review of Psychology, 40*, 109-109.

- Brewer, M. B., & Silver, M. (1978). Ingroup bias as a function of task characteristics. *European Journal of Social Psychology, 8*, 393-400.
- Briley, D. A., & Wyer, R. S. (2002). The effect of group membership salience on the avoidance of negative outcomes: Implications for social and consumer decisions. *Journal of Consumer Research, 29*(3), 400-415.
- Brown, R. J. (1984). The effects of intergroup similarity and cooperative vs. competitive orientation on intergroup discrimination. *British Journal of Social Psychology, 23*(1), 21-33.
- Brown, R. (2000). Social identity theory: Past achievements, current problems and future challenges. *European Journal of Social Psychology, 30*, 745-778.
- Brown, R., & Abrams, D. (1986). The effects of intergroup similarity and goal interdependence on intergroup attitudes and task performance. *Journal of Experimental Social Psychology, 22*(1), 78-92.
- Buskist, W., & Morgan, D. (1988). Method and theory in the study of human competition. In G. Davey & C. Cullen (Eds.), *Human operant conditioning and behavior modification*. New York: Wiley.
- Buunk, A. P., & Gibbons, F. X. (2007). Social comparison: The end of a theory and the emergence of a field. *Organizational Behavior and Human Decision Processes, 102*(1), 3-21.
- Campbell, D. T. (1965). *Ethnocentric and Other Altruistic Motives*. In D. Levine (Ed.), *Nebraska Symposium on Motivation Volume 13* (pp. 283-312). Lincoln, NE: University of Nebraska Press.

- Charland, L. C. (2005). The heat of emotion: Valence and the demarcation problem. *Journal of Consciousness Studies*, 12(8-10), 82-102.
- Cikara, M., Botvinick, M. M., & Fiske, S. T. (2011). Us versus them: Social identity shapes neural responses to intergroup competition and harm. *Psychological Science*, 22(3), 306-313.
- Cikara, M., Bruneau, E. G., & Saxe, R. R. (2011). Us and them: Intergroup failures of empathy. *Current Directions in Psychological Science*, 20(3), 149-153.
- Cohen, T. R., Montoya, R. M., & Insko, C. A. (2006). Group morality and intergroup relations: Cross-cultural and experimental evidence. *Personality and Social Psychology Bulletin*, 32(11), 1559-1559.
- Corenblum, B., & Stephan, W. G. (2001). White fears and native apprehensions: An integrated threat theory approach to intergroup attitudes. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, 33(4), 251-268.
- Cottrell, C. A., & Neuberg, S. L. (2005). Different emotional reactions to different groups: A sociofunctional threat-based approach to "prejudice". *Journal of Personality and Social Psychology*, 88(5), 770-789.
- Cozzolino, P. J., & Snyder, M. (2008). Good times, bad times: How personal disadvantage moderates the relationship between social dominance and efforts to win. *Personality and Social Psychology Bulletin*, 34, 1420-1420.
- Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2007). The BIAS map: Behaviors from intergroup affect and stereotypes. *Journal of Personality and Social Psychology*, 92(4), 631-648.

- De Dreu, C. K. W., & Nijstad, B. A. (2008). Mental set and creative thought in social conflict: Threat rigidity versus motivated focus. *Journal of Personality and Social Psychology, 95*(3), 648-661.
- de Zavala, A. G., Cichocka, A., Eidelson, R., & Jayawickreme, N. (2009). Collective narcissism and its social consequences. *Journal of Personality and Social Psychology, 97*(6), 1074-1096.
- Deaux, K., Reid, A., Mizrahi, K., & Ethier, K. A. (1995). Parameters of social identity. *Journal of Personality and Social Psychology, 68*(2), 280-291.
- Depe, R. K., & Harackiewicz, J. M. (1996). Self-handicapping and intrinsic motivation: Buffering intrinsic motivation from the threat of failure. *Journal of Personality and Social Psychology, 70*, 868-876.
- DeSteno, D., Dasgupta, N., Bartlett, M. Y., & Caidric, A. (2004). Prejudice from thin air: The effect of emotion on automatic intergroup attitudes. *Psychological Science, 15*(5), 319-324.
- Deutsch, M. (1949). A theory of cooperation and competition. *Human Relations, 2*, 129-152.
- Deutsch, M. (1962). Cooperation and trust: Some theoretical notes. In M. R. Jones (Ed.), *Nebraska symposium on motivation, 1962*. (pp. 275-320). Oxford, England: Univer. Nebraska Press.
- Deutsch, M. (2006). Cooperation and competition. In M. Deutsch, P. T. Coleman & E. C. Marcus (Eds.), *The handbook of conflict resolution: Theory and practice (2nd ed)*. (pp. 23-42). Hoboken, NJ, US: Wiley Publishing.

- Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: A theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, 130(3), 355-391.
- Diekmann, K. A., Tenbrunsel, A. E., & Galinsky, A. D. (2003). From self-prediction to self-defeat: Behavioral forecasting, self-fulfilling prophecies, and the effect of competitive expectations. *Journal of Personality and Social Psychology*, 85(4), 672-683.
- Drolet, A. L., & Morris, M. W. (2000). Rapport in conflict resolution: Accounting for how face-to-face contact fosters mutual cooperation in mixed-motive conflicts. *Journal of Experimental Social Psychology*, 36, 26-26.
- Dru, V. (2003). Relationships between an ego orientation scale and a hypercompetitive scale: Their correlates with dogmatism and authoritarianism factors. *Personality and Individual Differences*, 35, 1509-1524.
- Dru, V. (2007). Authoritarianism, social dominance orientation and prejudice: Effects of various self-categorization conditions. *Journal of Experimental Social Psychology*, 43(6), 877-883.
- Duckitt, J. (2001). A dual-process cognitive-motivational theory of ideology and prejudice. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, vol. 33. (pp. 41-113). San Diego, CA, US: Academic Press.
- Duckitt, J. (2006). Differential effects of right wing authoritarianism and social dominance orientation on outgroup attitudes and their mediation by threat from and competitiveness to outgroups. *Personality and Social Psychology Bulletin*, 32, 684-684.

- Duckitt, J., Wagner, C., du Plessis, I., & Birum, I. (2002). The psychological bases of ideology and prejudice: Testing a dual process model. *Journal of Personality and Social Psychology, 83*(1), 75-93. doi:10.1037/0022-3514.83.1.75
- Durvasula, S., & Lysonski, S. (2006). Impedance to globalization: The impact of economic threat and ethnocentrism. *Journal of Global Marketing, 19*, 9-32.
- Ellemers, N., Kortekaas, P., & Ouwerkerk, J. W. (1999). Self-categorisation, commitment to the group and group self-esteem as related but distinct aspects of social identity. *European Journal of Social Psychology, 29*(2-3), 371-389.
- Ellemers, N., Spears, R., & Doosje, B. (2002). Self and social identity. *Annual Review of Psychology, 53*, 161-186.
- Esses, V. M., Dovidio, J. F., Jackson, L. M., & Armstrong, T. L. (2001). The immigration dilemma: The role of perceived group competition, ethnic prejudice, and national identity. *Journal of Social Issues, 57*(3), 389-412.
- Esses, V. M., Haddock, G., & Zanna, M. P. (1993). Values, stereotypes, and emotions as determinants of intergroup attitudes. In D. M. Mackie, & D. L. Hamilton (Eds.), *Affect, cognition, and stereotyping: Interactive processes in group perception*. (, pp. 137-166). San Diego, CA, US: Academic Press.
- Esses, V. M., & Dovidio, J. F. (2002). The role of emotions in determining willingness to engage in intergroup contact. *Personality and Social Psychology Bulletin, 28*, 1202-1214.
- Esses, V. M., Dovidio, J. F., Jackson, L. M., & Armstrong, T. L. (2001). The immigration dilemma: The role of perceived group competition, ethnic prejudice, and national identity. *Journal of Social Issues, 57*, 389-389.

- Esses, V. M., Haddock, G., & Zanna, M. P. (1993). *Values, stereotypes, and emotions as determinants of intergroup attitudes*. San Diego, CA, US: Academic Press.
- Esses, V. M., Jackson, L. M., & Armstrong, T. L. (1998). Intergroup competition and attitudes toward immigrants and immigration: An instrumental model of group conflict. *Journal of Social Issues, 54*, 699-724.
- Federico, C. M., Golec, A., & Dial, J. L. (2005). The relationship between the need for closure and support for military action against Iraq: Moderating effects of national attachment. *Personality and Social Psychology Bulletin, 31*, 621-632.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117-140.
- Fiske, S. T. (2002). What we know about bias and intergroup conflict, the problem of the century. *Current Directions in Psychological Science, 11*(4), 123-128.
- Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. *Journal of Personality and Social Psychology, 82*(6), 878-902.
- Frijda, N. H. (2004). Emotions and action. In A. S. R. Manstead, N. Frijda & A. Fischer (Eds.), *Feelings and emotions: The amsterdam symposium, jun 2001, amsterdam, netherlands* (pp. 158-173). New York, NY, US: Cambridge University Press.
- Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology, 57*, 212-228.

- Gaertner, L., & Insko, C. A. (2000). Intergroup discrimination in the minimal group paradigm: Categorization, reciprocation, or fear? *Journal of Personality and Social Psychology, 79*(1), 77-94.
- Gibson, B., Sachau, D., Doll, B., & Shumate, R. (2002). Sandbagging in competition: Responding to the pressure of being the favorite. *Personality and Social Psychology Bulletin, 28*, 1119-1119.
- Golec, A., & Federico, C. M. (2004). Understanding responses to political conflict: Interactive effects of the need for closure and salient conflict schemas. *Journal of Personality and Social Psychology, 87*(6), 750-762.
- Gómez, Á., Brooks, M. L., Buhrmester, M. D., Vázquez, A., Jetten, J., & Swann, W. B. (2011). On the nature of identity fusion: Insights into the construct and a new measure. *Journal of Personality and Social Psychology, 100*(5), 918-933.
- Gordon, F. M., Welch, K. R., Offringa, G., & Katz, N. (2000). The complexity of social outcomes from cooperative, competitive, and individualistic reward systems. *Social Justice Research, 13*, 237-269. doi:10.1023/A:1026407422558
- Goren, H. (2001). The effect of outgroup competition on individual behavior and outgroup perception in the intergroup prisoner's dilemma (IPD) game. *Group Processes & Intergroup Relations, 4*, 160-160.
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. Jr. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*, 504-528.
- Grant, P. R. (1991). Ethnocentrism between groups of unequal power under threat in intergroup competition. *Journal of Social Psychology, 131*(1), 21-21.

- Grieve, P. G., & Hogg, M. A. (1999). Subjective uncertainty and intergroup discrimination in the minimal group situation. *Personality and Social Psychology Bulletin*, 25, 926-926.
- Guimond, S., & Dubé-Simard, L. (1983). Relative deprivation theory and the quebec nationalist movement: The cognition–emotion distinction and the personal–group deprivation issue. *Journal of Personality and Social Psychology*, 44(3), 526-535.
- Halperin, E. (2011). The emotional roots of intergroup aggression: The distinct roles of anger and hatred. In P. R. Shaver, & M. Mikulincer (Eds.), *Human aggression and violence: Causes, manifestations, and consequences*. (pp. 315-331). Washington, DC, US: American Psychological Association.
- Heine, S. J., Proulx, T., & Vohs, K. D. (2006). The meaning maintenance model: On the coherence of social motivations. *Personality and Social Psychology Review*, 10(2), 88-88.
- Hewstone, M., Rubin, M., & Willis, H. (2002). Intergroup bias. *Annual Review of Psychology*, 53, 575-604. doi:10.1146/annurev.psych.53.100901.135109
- Holtz, R., & Miller, N. (2001). Intergroup competition, attitudinal projection, and opinion certainty: Capitalizing on conflict. *Group Processes & Intergroup Relations*, 4, 61-61.
- Iyer, A., & Leach, C. W. (2008). Emotion in inter-group relations. *European Review of Social Psychology*, 19, 86-124.
- Jackson, J. W. (1993). Realistic group conflict theory: A review and evaluation of the theoretical and empirical literature. *The Psychological Record*, 43, 395-413.

- Jackson, J. W., & Smith, E. R. (1999). Conceptualizing social identity: A new framework and evidence for the impact of different dimensions. *Personality and Social Psychology Bulletin*, 25, 120-135.
- Jackson, L. M., & Esses, V. M. (2000). Effects of perceived economic competition on people's willingness to help empower immigrants. *Group Processes & Intergroup Relations*, 3, 419-419.
- Jetten, J., McAuliffe, B. J., Hornsey, M. J., & Hogg, M. A. (2006). Differentiation between and within groups: The influence of individualist and collectivist group norms. *European Journal of Social Psychology*, 36(6), 825-843.
- Jetten, J., Schmitt, M. T., Branscombe, N. R., Garza, A. A., & Mewse, A. J. (2011). Group commitment in the face of discrimination: The role of legitimacy appraisals. *European Journal of Social Psychology*, 41(1), 116-126.
- Jetten, J., Spears, R., Hogg, M. A., & Manstead, A. S. R. (2000). Discrimination constrained and justified: Variable effects of group variability and ingroup identification. *Journal of Experimental Social Psychology*, 36(4), 329-356.
- Jetten, J., Spears, R., & Manstead, A. S. R. (1997). Strength of identification and intergroup differentiation: The influence of group norms. *European Journal of Social Psychology*, 27(5), 603-609.
- Jetten, J., Spears, R., & Postmes, T. (2004). Intergroup distinctiveness and differentiation: A meta-analytic integration. *Journal of Personality and Social Psychology*, 86(6), 862-879.
- Johnson, D. W., & Johnson, R. T. (2005). New developments in social interdependence theory. *Genetic, social, and general psychology monographs*, 131, 285-358.

- Johnson, D. W., & Norem-Hebeisen, A. A. (1979). A measure of cooperative, competitive, and individualistic attitudes. *The Journal of Social Psychology, 109*(2), 253-261.
- Jost, J.T., & Thompson, E.P. (2000). Group-based dominance and opposition to equality as independent predictors of self-esteem, ethnocentrism, and social policy attitudes among African Americans and European Americans. *Journal of Experimental Social Psychology, 36*, 209–232.
- Judd, C., & Park, B. (1988). Outgroup homogeneity: Judgments of variability at the individual and group levels. *Journal of Personality and Social Psychology, 54*, 778-788.
- Kahn, A., & Ryen, A. H. (1972). Factors influencing the bias towards one's own group. *International Journal of Group Tensions, 2*, 33-50.
- Kawada, C. L. K., Oettingen, G., Gollwitzer, P. M., & Bargh, J. A. (2004). The projection of implicit and explicit goals. *Journal of Personality and Social Psychology, 86*(4), 545-559.
- Kay, A. C., & Jost, J. T. (2003). Complementary justice: Effects of "poor but happy" and "poor but honest" stereotype exemplars on system justification and implicit activation of the justice motive. *Journal of Personality and Social Psychology, 85*(5), 823-837.
- Kelley, H., & Thibault, J. (1978). *Interpersonal relations: A theory of interdependence*. New York, NY: Wiley.

- Kelley, H., & Thibaut, J. (1969). Group problem-solving. In G. Lindzey & E. Aronson (Eds.), *Handbook of social psychology* (2nd ed., Vol. 4, pp. 1–101). Reading, MA: Addison-Wesley.
- Kemmelmeier, M. (2005). The effects of race and social dominance orientation in simulated juror decision making. *Journal of Applied Social Psychology, 35*(5), 1030-1045.
- Kennedy, J., & Stephan, W. G. (1977). The effects of cooperation and competition on ingroup-outgroup bias. *Journal of Applied Social Psychology, 7*(2), 115-115.
doi:10.1111/j.1559-1816.1977.tb01333.x
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.
- Lazarus, R. S. (1991). Cognition and motivation in emotion. *American Psychologist, 46*(4), 352-367.
- Lazarus, R. S. (1999). In Dalglish T., Power M. J. (Eds.), *The cognition–emotion debate: A bit of history*. New York, NY, US: John Wiley & Sons Ltd, New York, NY.
- Leach, C. W., & Spears, R. (2008). "A vengefulness of the impotent": The pain of ingroup inferiority and schadenfreude toward successful outgroups. *Journal of Personality and Social Psychology, 95*, 1383-1383.
- Leach, C. W., van Zomeren, M., Zebel, S., Vliek, M. L. W., Pennekamp, S. F., Doosje, B., . . . Spears, R. (2008). Group-level self-definition and self-investment: A hierarchical (multicomponent) model of ingroup identification. *Journal of Personality and Social Psychology, 95*(1), 144-165.

- Leonardelli, G. J., & Brewer, M. B. (2001). Minority and majority discrimination: When and why. *Journal of Experimental Social Psychology, 37*(6), 468-485.
- Levine, R. A., & Campbell, D. T. (1972). *Ethnocentrism: theories of conflict, ethnic attitudes, and group behavior*. New York, NY: Wiley.
- Lickel, B., Hamilton, D. L., Wierzchowska, G., Lewis, A., Sherman, S. J., & Uhles, A. N. (2000). Varieties of groups and the perception of group entitativity. *Journal of Personality and Social Psychology, 78*(2), 223-246.
- Lipkus, I. (1991). The construction and preliminary validation of a global belief in a just world scale and the exploratory analysis of the multidimensional belief in a just world scale. *Personality and Individual Differences, 12*(11), 1171-1178.
- Louis, W. R., Duck, J. M., Terry, D. J., Schuller, R. A., & Lalonde, R. N. (2007). Why do citizens want to keep refugees out? threats, fairness and hostile norms in the treatment of asylum seekers. *European Journal of Social Psychology, 37*, 53-53.
- Louis, W. R., Taylor, D. M., & Douglas, R. L. (2005). Normative influence and rational conflict decisions: Group norms and cost-benefit analyses for intergroup behavior. *Group Processes & Intergroup Relations, 8*(4), 355-355.
- Maass, A., Cadinu, M., Guarnieri, G., & Grasselli, A. (2003). Sexual harassment under social identity threat: The computer harassment paradigm. *Journal of Personality and Social Psychology, 85*(5), 853-870.
- Mackie, D. M., Devos, T., & Smith, E. R. (2000). Intergroup emotions: Explaining offensive action tendencies in an intergroup context. *Journal of Personality and Social Psychology, 79*, 602-616.

- Mackie, D. M., & Smith, E. R. (1998). Intergroup relations: Insights from a theoretically integrative approach. *Psychological Review*, *105*(3), 499-529.
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, *58*, 593-614.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, *7*(1), 83-104.
- Maitner, A. T., Mackie, D. M., & Smith, E. R. (2006). Evidence for the regulatory function of intergroup emotion: Emotional consequences of implemented or impeded intergroup action tendencies. *Journal of Experimental Social Psychology*, *42*, 720-728.
- Martens, R. (1975). *Social psychology and physical activity*. New York, NY: Harper and Row Publishers.
- Martens, R. (1976). Competition: In need of a theory. In D. M. Landers (Ed.), *Social problems in athletics* (pp. 9–17). Urbana, IL: University of Illinois Press.
- Martens, R., Vealey, R. S., & Burton, D. (1995). *Competitive anxiety in sport*. Champaign, IL, England: Human Kinetics Publishers.
- Maxwell-Smith, M. A., & Esses, V. M. (2012). Assessing Individual Differences in the Degree to Which People are Committed to Following Their Beliefs. *Journal of Research in Personality*, *46*, 195-209.
- Maxwell-Smith, M. A., & Seligman, C. (2011, January). Applying the Competitive Elements Model to Understand How Competitive Outcomes Affect Evaluations

of One's Competitors. *Poster presented at the Society for Personality and Social Psychology 2010 Annual Meeting, San Antonio, TX.*

McClintock, C. G. (1972). Social motivation: A set of propositions. *Behavioral Science, 17*(5), 438-455.

McClintock, C., & Allison, S. (1989). Social value orientation and helping behavior. *Journal of Applied Social Psychology, 19*, 353-362.

Michinov, N., Dambrun, M., Guimond, S., & Méot, A. (2005). Social dominance orientation, prejudice, and discrimination: A new computer-based method for studying discriminatory behaviours. *Behavior Research Methods, 37*(1), 91-98.

Miller, B. W., Roberts, G. C., & Ommundsen, Y. (2005). Effect of perceived motivational climate on moral functioning, team moral atmosphere perceptions, and the legitimacy of intentionally injurious acts among competitive youth football players. *Psychology of Sport and Exercise, 6*(4), 461-477.

Mintah, J. K., Huddleston, S., & Doody, S. G. (1999). Justifications of aggressive behavior in contact and semicontact sports. *Journal of Applied Social Psychology, 29*(3), 597-605.

Mummendey, A., Klink, A., & Brown, R. (2001). Nationalism and patriotism: National identification and outgroup rejection. *British Journal of Social Psychology, 40*(2), 159-171.

Noor, M., Shnabel, N., Halabi, S., & Nadler, A. (in press). When suffering begets suffering: The psychology of competitive victimhood between adversarial groups in violent conflicts. *Personality and Social Psychology Review.*

- Nickerson, A. M., & Louis, W. R. (2008). Nationality versus humanity? personality, identity, and norms in relation to attitudes toward asylum seekers. *Journal of Applied Social Psychology, 38*, 796-796.
- Olson, J. M., & Stone, J. (2005). The influence of behavior on attitudes. In D. Albarracín, B. T. Johnson & M. P. Zanna (Eds.), *The handbook of attitudes*. (pp. 223-271). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Ouwerkerk, J. W., de Gilder, D., & de Vries, N. K. (2000). When the going gets tough, the tough get going: Social identification and individual effort in intergroup competition. *Personality and Social Psychology Bulletin, 26*, 1550-1550.
- Paolini, S., Hewstone, M., & Cairns, E. (2007). Direct and indirect intergroup friendship effects: Testing the moderating role of the affective-cognitive bases of prejudice. *Personality and Social Psychology Bulletin, 33*(10), 1406-1420.
- Perreault, S., & Bourhis, R. Y. (1998). Social identification, interdependence and discrimination. *Group Processes & Intergroup Relations, 1*, 49-66.
- Perreault, S., & Bourhis, R. Y. (1999). Ethnocentrism, social identification, and discrimination. *Personality and Social Psychology Bulletin, 25*, 92-103.
- Pratto, F., & Glasford, D. E. (2008). Ethnocentrism and the value of a human life. *Journal of Personality and Social Psychology, 95*, 1411-1428.
- Pratto, F., Sidanius, J., & Levin, S. (2006). Social dominance theory and the dynamics of intergroup relations: Taking stock and looking forward. *European Review of Social Psychology, 17*, 271-320.

- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*, 741-763.
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments & Computers. Special Issue: Web-Based Archive of Norms, Stimuli, and Data: Part 2, 36(4)*, 717-731.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40(3)*, 879-891.
- Rabbie, J. M., & de Brey, J. H. (1971). The anticipation of intergroup cooperation and competition under private and public conditions. *International Journal of Group Tensions, 1(3)*, 230-251.
- Rees, C. R., & Segal, M. W. (1984). Intergroup competition, equity, and interpersonal attraction. *Social Psychology Quarterly, 47*, 328-336.
- Reynolds, W. M. (1982). Development of reliable and valid short forms of the marlowe-crowne social desirability scale. *Journal of Clinical Psychology, 38(1)*, 119-125.
- Roccas, S., Klar, Y., & Liviatan, I. (2006). The paradox of group-based guilt: Modes of national identification, conflict vehemence, and reactions to the ingroup's moral violations. *Journal of Personality and Social Psychology, 91(4)*, 698-698.
- Rohleder, N., Beulen, S. E., Chen, E., Wolf, J. M., & Kirschbaum, C. (2007). Stress on the dance floor: The cortisol stress response to social-evaluative threat in

- competitive ballroom dancers. *Personality and Social Psychology Bulletin*, 33, 69-69.
- Roseth, C. J., Johnson, D. W., & Johnson, R. T. (2008). Promoting early adolescents' achievement and peer relationships: The effects of cooperative, competitive, and individualistic goal structures. *Psychological Bulletin*, 134, 223-223.
- Ruscher, J. B., Fiske, S. T., Miki, H., & Van Manen, S. (1991). Individuating processes in competition: Interpersonal versus intergroup. *Personality and Social Psychology Bulletin*, 17, 595-595.
- Ryckman, R. M., Thornton, B., & Gold, J. A. (2009). Assessing competition avoidance as a basic personality dimension. *Journal of Psychology: Interdisciplinary and Applied*, 143(2), 175-192.
- Ryckman, R. M., Hammer, M., Kaczor, L. M., & Gold, J. A. (1990). Construction of a hypercompetitive attitude scale. *Journal of Personality Assessment*, 55, 630-639.
- Ryen, A. H., & Kahn, A. (1975). Effects of intergroup orientation on group attitudes and proxemic behavior. *Journal of Personality and Social Psychology*, 31, 302-310.
- Salvador, A. (2005). Coping with competitive situations in humans. *Neuroscience & Biobehavioral Reviews. Special Issue: Individual Differences in Behavior and Physiology: Causes and Consequences*, 29, 195-205.
- Salvador, A., & Costa, R. (2009). Coping with competition: Neuroendocrine responses and cognitive variables. *Neuroscience and Biobehavioral Reviews*, 33(2), 160-170.

- Sassenberg, K., Moskowitz, G. B., Jacoby, J., & Hansen, N. (2007). The carry-over effect of competition: The impact of competition on prejudice towards uninvolved outgroups. *Journal of Experimental Social Psychology, 43*, 529-529.
- Scheepers, D., Spears, R., Doosje, B., & Manstead, A. S. R. (2002). Integrating identity and instrumental approaches to intergroup differentiation: Different contexts, different motives. *Personality and Social Psychology Bulletin, 28*, 1455-1467.
- Scheepers, D., Spears, R., Doosje, B., & Manstead, A. S. R. (2003). Two functions of verbal intergroup discrimination: Identity and instrumental motives as a result of group identification and threat. *Personality and Social Psychology Bulletin, 29*, 568-577.
- Scheepers, D., Spears, R., Doosje, B., & Manstead, A. S. R. (2006a). Diversity in ingroup bias: Structural factors, situational features, and social functions. *Journal of Personality and Social Psychology, 90*, 944-960.
- Scheepers, D., Spears, R., Doosje, B., & Manstead, A. S. R. (2006b). The social functions of ingroup bias: Creating, confirming, or changing social reality. *European Review of Social Psychology, 17*, 359-396. doi:10.1080/10463280601088773
- Schmitt, M. T., Branscombe, N. R., & Kappen, D. M. (2003). Attitudes toward group-based inequality: Social dominance or social identity? *British Journal of Social Psychology, 42*(2), 161-186.
- Schütte, K., & Kessler, T. (2007). Emotions in negative intergroup relations: An affective route to outgroup derogation. In G. Steffgen, & M. Gollwitzer (Eds.), *Emotions and aggressive behavior* (pp. 149-163). Ashland, OH, US: Hogrefe & Huber Publishers, Ashland, OH.

Seta, J. J. (1982). The impact of comparison processes on coactors' task performance.

Journal of Personality and Social Psychology, 42(2), 281-291.

Shah, J. Y., Kruglanski, A. W., & Friedman, R. (2003). Goal systems theory: Integrating the cognitive and motivational aspects of self-regulation. In S. J. Spencer, S. Fein, M. P. Zanna & J. M. Olson (Eds.), *Motivated social perception: The ontario symposium, vol. 9* (pp. 247-275). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, Mahwah, NJ.

Sherif, M. (1966). *Group conflict and co-operation: Their social psychology*. London, UK: Routledge & Kegan Paul.

Sherif, M, Harvey, O. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup cooperation and competition: The Robbers Cave experiment*. Norman, OK: University Book Exchange.

Shimp, T. A., & Sharma, S. (1987). Consumer ethnocentrism: Construction and validation of the CETSCALE. *Journal of Marketing Research*, 24, 280-289.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7, 422-445.

Sidanius, J., Haley, H., Molina, L., & Pratto, F. (2007). Vladimir's choice and the distribution of social resources: A group dominance perspective. *Group Processes & Intergroup Relations*, 10, 257-257.

Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York, NY, US: Cambridge University Press, New York, NY.

- Sidanius, J., Pratto, F., van Laar, C., & Levin, S. (2004). Social dominance theory: Its agenda and method. *Political Psychology, 25*(6), 845-880.
- Smith, E. R., Seger, C. R., & Mackie, D. M. (2007). Can emotions be truly group level? evidence regarding four conceptual criteria. *Journal of Personality and Social Psychology, 93*(3), 431-446.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp. 290-312). San Francisco: Jossey-Bass.
- Sommer, S. M. (1995). Social competition: Identifying new perspectives and strategies for task motivation. *International Journal of Conflict Management, 6*, 239-256.
- Spencer-Rodgers, J., Srivastava, S., & Peng, K. (2001). *The dialectical self scale*. Unpublished data.
- Stanne, M. B., Johnson, D. W., & Johnson, R. T. (1999). Does competition enhance or inhibit motor performance: A meta-analysis. *Psychological Bulletin, 125*(1), 133-154.
- Staub, E. (2000). Genocide and mass killing: Origins, prevention, healing and reconciliation. *Political Psychology, 21*(2), 367-382.
- Stephan, W. G., Boniecki, K. A., Ybarra, O., Bettencourt, A., Ervin, K. S., Jackson, L. A., . . . Renfro, C. L. (2002). The role of threats in the racial attitudes of blacks and white. *Personality and Social Psychology Bulletin, 28*(9), 1242-1254.
- Stephan, W. G., Renfro, C. L., Esses, V. M., Stephan, C. W., & Martin, T. (2005). The effects of feeling threatened on attitudes toward immigrants. *International Journal of Intercultural Relations, 29*(1), 1-19.

- Stephan, W. G., & Stephan, C. W. (1996). Predicting prejudice. *International Journal of Intercultural Relations. Special Issue: Prejudice, Discrimination and Conflict*, 20(3-4), 409-426.
- Stephan, W. G., Stephan, C. W., & Gudykunst, W. B. (1999). Anxiety in intergroup relations: A comparison of anxiety/uncertainty management theory and integrated threat theory. *International Journal of Intercultural Relations. Special Issue: Theory and Research on Intercultural Relations*, 23, 613-613.
- Struch, N., & Schwartz, S. H. (1989). Intergroup aggression: Its predictors and distinctness from ingroup bias. *Journal of Personality and Social Psychology*, 56, 364-373.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics (4th ed.)*. Boston, MA: Allyn & Bacon/Pearson Education, Boston, MA.
- Talaska, C. A., Fiske, S. T., & Chaiken, S. (2008). Legitimizing racial discrimination: Emotions, not beliefs, best predict discrimination in a meta-analysis. *Social Justice Research*, 21, 263-296.
- Tajfel, H. & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W.G. Austin (Eds.), *Psychology of intergroup relations* (pp. 7-24). Chicago: Nelson-Hall.
- Tausch, N., Tam, T., Hewstone, M., Kenworthy, J., & Cairns, E. (2007). Individual-level and group-level mediators of contact effects in northern ireland: The moderating role of social identification. *British Journal of Social Psychology*, 46(3), 541-556.
- Taylor, D. A., & Moriarty, B. F. (1987). Ingroup bias as a function of competition and race. *Journal of Conflict Resolution*, 31, 192-192.

- Tetlock, P. E., & Levi, A. (1982). Attribution bias: On the inconclusiveness of the cognition–motivation debate. *Journal of Experimental Social Psychology, 18*(1), 68-88.
- Thomsen, L., Green, E. G. T., & Sidanius, J. (2008). We will hunt them down: How social dominance orientation and right-wing authoritarianism fuel ethnic persecution of immigrants in fundamentally different ways. *Journal of Experimental Social Psychology, 44*(6), 1455-1464.
- Tropp, L. R., & Wright, S. C. (1999). Ingroup identification and relative deprivation: An examination across multiple social comparisons. *European Journal of Social Psychology, 29*(5-6), 707-724.
- Turner, J. C. (1975). Social comparison and social identity: Some prospects for intergroup behaviour. *European Journal of Social Psychology, 5*(1), 5-34.
- Turner, J. C., Brown, R. J., & Tajfel, H. (1979). Social comparison and group interest in ingroup favouritism. *European Journal of Social Psychology, 5*, 5-34.
- Tyerman, A., & Spencer, C. (1983). A critical test of the sherifs' robber's cave experiments: Intergroup competition and cooperation between groups of well-acquainted individuals. *Small Group Behavior, 14*(4), 515-531.
- Tyler, T. R. (2006). Psychological perspectives on legitimacy and legitimation. *Annual Review of Psychology, 57*, 375-400.
- Van Lange, P. A. M., De Cremer, D., Van Dijk, E., & Van Vugt, M. (2007). In Kruglanski A. W., Higgins E. T. (Eds.), *Self-interest and beyond: Basic principles of social interaction*. New York, NY, US: Guilford Press, New York, NY.

- Van Vugt, M., De Cremer, D., & Janssen, D. P. (2007). Gender differences in cooperation and competition: The male-warrior hypothesis. *Psychological Science, 18*, 19-23.
- Wagner, U., & Christ, O. (2007). Intergroup aggression and emotions: A framework and first data. In G. Steffgen, & M. Gollwitzer (Eds.), *Emotions and aggressive behavior*. (pp. 133-148). Ashland, OH, US: Hogrefe & Huber Publishers.
- Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology, 67*, 1049–1062.
- Wildschut, T., Pinter, B., Vevea, J. L., Insko, C. A., & Schopler, J. (2003). Beyond the group mind: A quantitative review of the interindividual-intergroup discontinuity effect. *Psychological Bulletin, 129*(5), 698-722.
- Zárate, M. A., Garcia, B., Garza, A. A., & Hitlan, R. T. (2004). Cultural threat and perceived realistic group conflict as dual predictors of prejudice. *Journal of Experimental Social Psychology, 40*, 99-99.

Appendix A: Items from Self-Report Likert Scales (Studies 1-3)

Social Dominance Orientation (Studies 1, 3)

Scale: 1 = *Disagree strongly*; 7 = *Agree strongly*

- Some groups of people are just more worthy than others.
- We should do what we can to equalize conditions for different groups. (reversed)
- In getting what your group wants, it is sometimes necessary to use force against other groups.
- If certain groups of people stayed in their place, we would have fewer problems.
- We would have fewer problems if we treated different groups more equally. (reversed)
- To get ahead in life, it is sometimes necessary to step on other groups.
- No one group should dominate in society. (reversed)
- Group equality should be our ideal. (reversed)
- All groups should be given an equal chance in life. (reversed)
- We must increase social equality. (reversed)
- Superior groups should dominate inferior groups.
- It's probably a good thing that certain groups are at the top and other groups are at the bottom.
- We must strive to make incomes more equal. (reversed)
- Sometimes other groups must be kept in their place.
- It would be good if all groups could be equal. (reversed)
- Inferior groups should stay in their place.

Shortened Social Dominance Orientation (Study 2)

Scale: 1 = *Disagree strongly*; 7 = *Agree strongly*

- If certain groups of people stayed in their place, we would have fewer problems.
- Some groups of people are simply inferior to other groups.
- Inferior groups should stay in their place.
- Some people are just inferior to others.
- Some groups of people are just more worthy than others.
- It is OK with me that some groups have fewer resources than others.
- Devaluation of some social groups is perfectly justifiable.
- I don't have any problems with the idea that some groups control the fate of other groups.
- It is OK with me that some groups have more control over public policy than others.
- It is OK with me that some groups are dominated by other groups.

Dialectical Thinking Questionnaire (Studies 1-2)

Scale: 1 = *Strongly disagree*; 5 = *Strongly agree*

- When I hear two sides of an argument, I often agree with both.
- I sometimes believe two things that contradict each other
- If there are two opposing sides to an argument, they cannot both be right.
- I find that if I look hard enough, I can figure out which side of a controversial issue is right.
- For most important issues, there is one right answer.
- When two sides disagree, the truth is always somewhere in the middle.

Competitive Intergroup Perceptions (CIP; Study 1)

Scale: 1 = *Strongly disagree*; 7 = *Strongly agree*

I believe deductive thinkers are in competition with inductive thinkers.

It is fair to describe the situation between deductive thinkers and inductive thinkers as competitive.

When I think of myself as a deductive thinker, I think I am competing against other inductive thinkers.

For better or worse, inductive thinkers are trying to outperform deductive thinkers, and vice versa.

(CIP; Studies 2-3)

Deductive thinkers/Western students are in competition with inductive thinkers/Waterloo students on the performance task.

It is fair to describe the upcoming academic performance task as a competition between deductive thinkers/Western students and inductive thinkers/Waterloo students.

For better or for worse, inductive thinkers/Waterloo students are trying to achieve a more positive outcome on the performance task than deductive thinkers/Western students, and vice versa.

Competitive Intergroup Motivations (CIM; Study 1)

Scale: 1 = *Strongly disagree*; 7 = *Strongly agree*

I want deductive thinkers to be seen as better than inductive thinkers, regardless of whether we are in competition or not.

I want deductive thinkers to have more resources at their disposal than inductive thinkers.

Deductive thinkers should always try to do better than their inductive thinker peers.

It is important for me that deductive thinkers are superior to inductive thinkers.

It is essential that deductive thinkers try to outperform inductive thinkers whenever they can.

As a deductive thinkers I am motivated to compete against inductive thinkers.

(CIM; Studies 2-3)

I want deductive thinkers/Western students to answer more questions correctly on the upcoming group performance task than inductive thinkers/Waterloo students.

It is very important for me that deductive thinkers/Western students answer more questions correctly on the upcoming group performance task than inductive thinkers/Waterloo students.

As a deductive thinker/Western student I am motivated to answer more questions correctly on the upcoming group performance task than other inductive thinkers/Waterloo students.

Ingroup Identification (Studies 1-3)

Scale: 1 = *Strongly disagree*; 7 = *Strongly agree*

Being a deductive thinker/Western student just feels natural to me.

I have a lot in common with the average deductive thinker/Western student.

Deductive thinkers/Western students are an important group to me.

I see myself as deductive thinker/Western student.

I identify with other deductive thinkers/Western students.

I am similar to the average deductive thinker/Western student.

I feel strong ties with other deductive thinkers/Western students.
 Belonging to this group is an important part of my identity.

Discriminatory outgroup intentions (Study 1)

Scale: 1 = *Not at all willing*; 10 = *Extremely willing*

Make sure inductive thinkers don't get as many resources as deductive thinkers.
 Try to make sure that deductive thinkers have a better reputation than inductive thinkers.
 Strive for equality between inductive thinkers and deductive thinkers.*
 Keep inductive thinkers 'in their place', without destroying or harming them.
 Work to ensure that deductive thinkers have more opportunities for success than inductive thinkers.

Prosocial outgroup intentions (Study 1)

Scale: 1 = *Not at all willing*; 10 = *Extremely willing*

Try to be friends with an inductive thinker.
 Associate with other inductive thinkers, rather than deductive thinkers.
 Help inductive thinkers wherever possible.
 Support inductive thinkers.

Incentive appeal (Studies 2-3)

Performing well on the group-performance task would be: (1 = *Not at all impressive*; 7 = *Very impressive*)

Performing well on the group-performance task would be: (1 = *Not at all appealing*; 7 = *Very appealing*)

*I want the other Western students in my group to perform well on this performance task
 (1 = *Strongly disagree*; 7 = *Strongly agree*)

*This item was added in Study 3.

Perceived difficulty (Studies 2-3)

I expect the full performance task to be: (1 = *Very easy*; 7 = *Very difficult*)

*Successfully accomplishing our group's performance goals will be: (1 = *Very easy*; 7 = *Very difficult*)

*This item was added in Study 3.

Task interest. (Studies 2-3)

I expect the full performance task to be: (1 = *Very unpleasant*; 7 = *Very enjoyable*)

I expect the full performance task to be: (1 = *Very boring*; 7 = *Very interesting*)

Hypercompetitiveness (Studies 2-3)

Scale: 1 = *Strongly disagree*; 7 = *Strongly agree*

Winning in competition makes me feel more powerful as a person.

Competition inspires me to excel.

I find myself being competitive even in situations which do not call for competition.

Winning in competition does not give me a greater sense of worth. (reversed)

Outgroup contact (Study 3)

Scale: 1 = *None at all*; 7 = *A great deal*

Have you met students from the University of Waterloo?

How much contact have you had with students from the University of Waterloo at parties or social events?

Do you have any friends who attend the University of Waterloo?

Do you have any family members who attend the University of Waterloo?

Perceived social status (Study 3)

Scale: 1 = *Much worse*; 4 = *Equal*; 7 = *Much better*

Compared with Waterloo students, the overall reputation of Western students is:

The amount of job opportunities Western graduates have compared with Waterloo graduates is:

The potential to achieve success for Western students, compared with Waterloo students, is:

Appendix B: Instructions and Example Items from Thinking Style Assessment

(Studies 1-2)

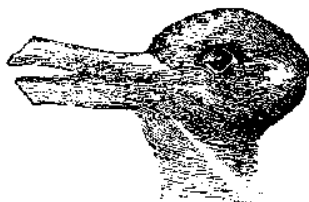
“For each of the following trials, you will be asked to look at pictures and answer questions from what you see in these pictures. It is important to keep in mind that there are no right or wrong answers. Do not try to “overthink” each picture. Instead, state your answer based what feels natural to you. Often, the first answer that comes to mind is your most natural response.

How many faces, if any, are in this image?



- 0
- 1-2
- 3-5
- 6-9
- 10 or more

What animal do you see in this image? (If you see more than one, indicate which one you see first.)



- Rabbit/hare
- Duck/bird
- Other (please specify): <specify>

Are the objects in this image balanced?



- Yes
- No

Appendix C: Fictional Article about Thinking Style Research (Studies 1-2)

FEATURE STORY

Thinking Styles Give Us Something to Think About:

Inductive and Deductive Thinking Styles are Still Surprising and Eluding Researchers.

Martin M. Antony, Ph.D., Chair, CPA
Convention Committee

In recent years, the topic of inductive and deductive thinking styles has evolved into an interesting line of research with surprising new findings that have caught many scientists off-guard. Dr. Finlay Thompson, a leading researcher on inductive and deductive thinking styles at the Institute of Social Cognition and Neurology, in Jacksonville, will be summarizing the latest developments of this research at the upcoming Canadian Psychological Convention in June 2011.

Inductive and deductive thinking refers to a tendency for people to use inductive or deductive logic to make sense of the information they come across in their day-to-day lives. At first, the finding that some people relied more on inductive logic, and others on deductive logic seemed fairly straightforward. What is surprising, however, is how these thinking styles relate to people's thinking and behaviour in other aspects of their lives.

Some studies (Thompson et al., 2005; Spears & Ames, 2007) have shown that, within their own groups, inductive and deductive thinkers share a lot of similarities. For example, inductive thinkers tend to, on average, share more similar colour and music preferences with other inductive thinkers than with other deductive thinkers, and vice versa.

Other research has extended these findings further. Thompson and Mummendey (2007) have found that, within their own groups, inductive thinkers tend to have fairly similar lifestyles, beliefs, and values as other inductive thinkers, and likewise for deductive thinkers. Some consumer-psychology based research has found

a tendency for inductive thinkers to enjoy bike rides and film editing, whereas deductive thinkers preferred hiking and photography (Kortekaas & Sassenberg, 2004). Other research has shown that inductive and deductive thinkers have, at times, differed in terms of their voting preferences as well (Krosnick & McConohay, 1998).

Given these findings, researchers such as Dr. Thompson are now examining how the two inductive thinking and deductive thinking groups compare with each other in terms of social adjustment and task performance across a number of domains. Dr. Thompson and her colleagues are currently conducting studies to see whether inductive thinkers and deductive thinkers are more likely to score highly on tests of motor skills, academic and intellectual aptitude, teamwork, job performance, and other social skills such as the ability to build strong social and romantic relationships, or maintain successful careers.

What findings can we expect from these studies? So far, research findings on how inductive and deductive thinkers perform relative to each other vary widely from study to study, and these findings have not been replicated consistently. Some studies show that inductive thinkers perform better than deductive thinkers, whereas other studies show that the performance level is higher for deductive than inductive thinkers. Part of the confusion stems from the fact that these studies do not always measure performance the same way. Dr. Thompson agrees that, "for the time being, the research does not allow for any clear conclusions as to which group—inductive or deductive thinkers—may do better on any given performance measure."

Therefore, it seems that there is ultimately a 50/50 chance as to which group—inductive or deductive thinkers—will do better on any given performance measure, but Dr. Thompson is optimistic that her and her colleagues' new studies will help overcome past confusion and uncover the true distinctions between these two thinking style groups. Moreover, her CPA Convention talk will be the first venue in which this research is presented. As such, we are looking forward to hosting her in Toronto in June 2011, and we are anticipating an exciting discussion of this burgeoning line of research.

References

- Kortekaas, N., & Sassenberg, H. (2004). Inducing or deducing fun: Do inductive and deductive thinkers enjoy different types of recreational activities? *Journal of Consumer Psychology, 5*, 236-247.
- Krosnick, D., & McConohay, M. (1998). Thinking style and political ideology: Do voting preferences differ between inductive and deductive thinkers? *Journal of Political Psychology, 19*, 115-123.
- Spears, B., & Ames, R. (2007). Music and color preferences among inductive and deductive thinkers: Between-group differences and within-group similarities. *Journal of Sensation and Perception, 56*, 342-359.
- Thompson, F., & Mummendey, N. (2007). Can thinking style affect lifestyle? Evidence for differences in lifestyles, beliefs, and values between inductive and deductive thinkers. *Journal of Personality and Social Psychology, 95*, 784-798.
- Thompson, F., Mummendey, N., Smith, J., Goncalves, R., Yu, H., & Green, L. (2005). Thinking in color and sound: Does thinking style relate to different preferences in music and color. *Journal of Sensation and Perception, 54*, 241-259.



Appendix D: Participant Instructions for Tajfel Matrices (Study 2)

[Page 1:]

“In the following exercise, you will be asked to award points to other people who are in TODAY'S SESSION WITH YOU.

That is, each person is given a participant identification number (e.g., in this study you are identified as Participant 37). Everyone will be distributing points to a random selection of other Deductive and Inductive thinkers in today's session.

THE POINTS ACCUMULATED IN THIS EXERCISE COUNT TOWARD THE QUESTIONS YOU MUST ANSWER CORRECTLY IN THE PERFORMANCE MEASURE AT THE END OF TODAY'S SESSION.

In this exercise, group members accumulate points on behalf of their group. Points are counted as questions answered correctly in the performance program. Therefore, the points that an individual accumulates in this exercise will improve that person's group's percentage of questions answered correctly.

Press any key when you are ready to continue.”

[Page 2:]

“In this exercise, you will see a table at the center of each page as shown below. For each table, you are to award points to two other people who will participate in a future session of the current study.

In a simulated example below, the top row of numbers within the table are points that can be given to Participant 1 who has been identified as a Deductive thinker, and the bottom row are points that can be given to Participant 2 who has been identified as a Inductive thinker.

After looking at each column in the table, you must choose only one column that represents your choice of how you wish to award the points to the individuals from both groups.

When you have chosen the column you wish, you would indicate your choice by pressing the letter key on the keyboard (any key from 'A' to 'M') that is associated with that column.

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 1; Deductive thinker:	11	12	13	14	15	16	17	18	19	20	21	22	23
Points to Participant 2; Inductive thinker:	5	7	9	11	13	15	17	19	21	23	25	27	29

Press any key when you are ready to continue.”

[Page 3:]

“Following the previous simulated example of how to make your choices, let us say that you are faced with the table below. In this table, you are being asked to distribute points to Participant 1 and Participant 2.

There are a variety of choices you can make. If you decide to choose a column toward the left-hand edge of this table, for example, column 'A', this means you are giving 11 points to Participant 1, and 5 points to Participant 2.

Alternatively, you might choose column 'J'. This means you are giving 20 points to Participant 1, and 23 points to Participant 2.

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 1; Deductive thinker:	11	12	13	14	15	16	17	18	19	20	21	22	23
Points to Participant 2; Inductive thinker:	5	7	9	11	13	15	17	19	21	23	25	27	29

Press any key when you are ready to continue.”

[Page 4:]

“The program will calculate the average points allocated to each person in the current session, and the points that are allocated to that person will be put toward that person’s group.

For example, if everyone in your session today awarded you with an average of 10 points across all of these decisions, these 10 points would be put toward your group’s point total. The total number of points accumulated by all group members will count as questions answered correctly in the upcoming performance measure.

Note that you are NEVER AWARDING POINTS TO YOURSELF. Every person’s trials are arranged so that their own participation identification number never appears in the any of the point distribution choices shown to them. In addition, all of your decisions are confidential; they will never be shown to other participants in your session.

Press any key when you are ready to continue.”

[Page 5:]

“Each page that you will see in this exercise contains different tables, with different combinations of numbers in the columns. So, as you go from one page to another, choose your columns carefully.

Regardless of your final decisions, make sure that before each decision, you carefully examine the two numbers contained in each column of the table. Once you make your decision, select your column of choice by pressing the letter key on the keyboard (any key from 'A' to 'M') that is associated with that column.

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant __; _____ thinker:	?	?	?	?	?	?	?	?	?	?	?	?	?
Points to Participant __; _____ thinker:	?	?	?	?	?	?	?	?	?	?	?	?	?

Press any key when you are ready to continue.”

[Page 6:]

“In the next few trials, you will be distributing points between participants who will participate in a today's session with you.
This is the last page of instructions, and the exercise will start on the next page. If you have any questions, or want to verify the instructions, please find the experimenter.

Press any key when you are ready to continue.”

Appendix E: Tajfel Matrices (Studies 2-3)

Note. Participants are asked to choose a column from A-M. In the examples below, the ingroup is presented on the top row, although Studies 2-3 also presented the inverse of each matrix with an outgroup member on the top row. The ingroup for Studies 2 and 3 was Deductive thinkers and Western students, respectively, and the outgroup for Studies 2 and 3 was Inductive thinkers and Waterloo students, respectively.

Matrices 1 and 2: MD vs. MJP + MIP

Strategies opposed table (strongest use of MD on column M; strongest use of MJP+MIP on column A):

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	19	18	17	16	15	14	13	12	11	10	9	8	7
Points to Participant 36; Inductive thinker:	25	23	21	19	17	15	13	11	9	7	5	3	1

Strategies together table (strongest use of MD and MJP+MIP on column M):

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	1	3	5	7	9	11	13	15	17	19	21	23	25
Points to Participant 34; Inductive thinker:	7	8	9	10	11	12	13	14	15	16	17	18	19

Pull score calculations:

- Strategies opposed table: zero point at 19/25 (column A), counted in increments from the left (i.e., column L would earn a rank score of 11)
- Strategies together table: zero point at 25/19 (column M) counted in increments from the right (i.e., column K would earn a rank score of 2)
- **Pull score of MD vs. MJP + MIP** = Strategies opposed rank score - strategies together score (e.g., selections of column L and K would be 11-2=9)
- **Pull of MJP + MIP vs. MD** = 12 - Strategies opposed rank score - strategies together rank score (e.g., selections of column L and K would be 12-11-2=-1)

(Appendix E continues next page)

Matrices 3 and 4: FAV (MIP + MD) vs. MJP

Strategies opposed table (strongest use of FAV on column A; strongest use of MJP on column M):

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	19	18	17	16	15	14	13	12	11	10	9	8	7
Points to Participant 39; Inductive thinker:	1	3	5	7	9	11	13	15	17	19	21	23	25

Strategies together table (strongest use of FAV and MJP on column A):

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	25	23	21	19	17	15	13	11	9	7	5	3	1
Points to Participant 36; Inductive thinker:	7	8	9	10	11	12	13	14	15	16	17	18	19

Pull score calculations:

- Strategies opposed table: zero point at 7/25 (column M), counted in increments from the right (i.e., column E would earn a rank score of 8)
- Strategies together table: zero point at 25/7 (column A) counted in increments from the left (i.e., column E would earn a rank score of 4)
- **Pull of FAV (MIP + MD) vs. MJP:** Strategies opposed rank score - strategies together score (e.g., selections of column E and E would be $8-4=4$)
- **Pull of MJP vs. FAV (MIP + MD):** 12 - Strategies opposed rank score - strategies together rank score (e.g., selections of column F and M would be $12-8-4=0$)

(Appendix E continues next page)

Matrices 5 and 6: P vs. FAV (MIP + MD)

Strategies opposed table (strongest use of P on column A; strongest use of FAV on column M):

	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	16	17	18	19	20	21	22	23	24	25	26	27	28
Points to Participant 39; Inductive thinker:	16	15	14	13	12	11	10	9	8	7	6	5	4

Strategies together table (strongest use of P and FAV on column M):

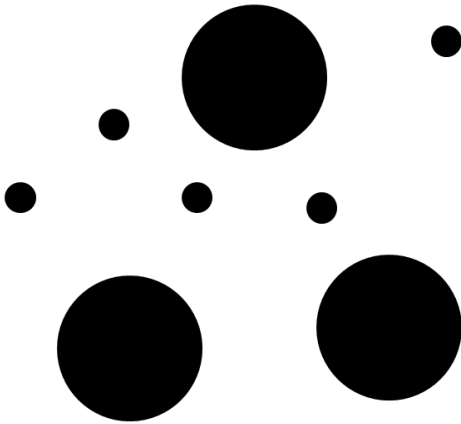
	A	B	C	D	E	F	G	H	I	J	K	L	M
Points to Participant 35; Deductive thinker:	4	5	6	7	8	9	10	11	12	13	14	15	16
Points to Participant 34; Inductive thinker:	28	27	26	25	24	23	22	21	20	19	18	17	16

Pull score calculations:

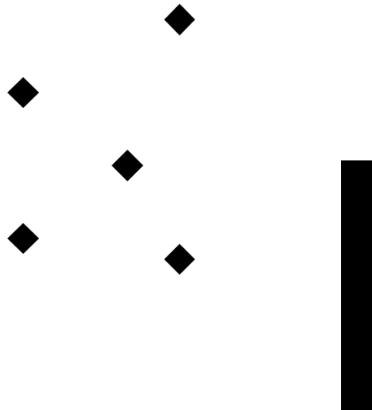
- Strategies opposed table: zero point at 28/4 (column M), counted in increments from the right (i.e., column F would earn a rank score of 7)
- Strategies together table: zero point at 16/16 (column M) counted in increments from the right (i.e., column M would earn a rank score of 0)
- **Pull of P vs. FAV (MIP + MD):** Strategies opposed rank score - strategies together score (e.g., selections of column F and M would be $7-0=7$)
- **Pull of FAV (MIP + MD) vs. P:** 12 - Strategies opposed rank score - strategies together rank score (e.g., selections of column F and M would be $12-7-0=5$)

Appendix F: Example Images used in the Object Recognition Task in Study 3

Instructions: "In the next part of this task, you will complete a series of trials in which each trial quickly presents a mask ("#####") followed by a picture that has a specific number of objects in it. Your task is to indicate as quickly as possible how many objects you saw in the picture."



- Option 1: Press the "A" key with your left hand if you saw 8 objects.
- Option 2: Press the "5" key with your right hand if you saw 7 objects.



- Option 1: Press the "A" key with your left hand if you saw 5 objects.
- Option 2: Press the "5" key with your right hand if you saw 6 objects.

Appendix G: Ethics Approval, Study 1



Department of Psychology The University of Western Ontario
 Room 7418 Social Sciences Centre,
 London, ON, Canada N6A 5C1
 Telephone: (519) 661-2067 Fax: (519) 661-3961

Use of Human Subjects - Ethics Approval Notice

Review Number	11 01 06	Approval Date	11 01 18
Principal Investigator	Clive Seligman/Matthew Maxwell-Smith	End Date	11 04 30
Protocol Title	How do people's thinking styles relate to their opinions?		
Sponsor	n/a		

This is to notify you that The University of Western Ontario Department of Psychology Research Ethics Board (PREB) has granted expedited ethics approval to the above named research study on the date noted above.

The PREB is a sub-REB of The University of Western Ontario's Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario. (See Office of Research Ethics web site: <http://www.uwo.ca/research/ethics/>)

This approval shall remain valid until end date noted above assuming timely and acceptable responses to the University's periodic requests for surveillance and monitoring information.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the PREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of research assistant, telephone number etc). Subjects must receive a copy of the information/consent documentation.

Investigators must promptly also report to the PREB:

- a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) all adverse and unexpected experiences or events that are both serious and unexpected;
- c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to the PREB for approval.

Members of the PREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the PREB.

Clive Seligman Ph.D.

Chair, Psychology Expedited Research Ethics Board (PREB)

The other members of the 2010-2011 PREB are: Mike Atkinson (Introductory Psychology Coordinator), David Dozoi, Vicki Esses, Riley Hinson, Albert Katz (Department Chair), and Tom O'Neill (Graduate Student Representative)

CC: UWO Office of Research Ethics

This is an official document. Please retain the original in your files

Appendix H: Ethics Approval, Study 2



Department of Psychology The University of Western Ontario
 Room 7418 Social Sciences Centre,
 London, ON, Canada N6A 5C1
 Telephone: (519) 661-2067 Fax: (519) 661-3961

Use of Human Subjects - Ethics Approval Notice

Review Number	11 10 08	Approval Date	11 10 18
Principal Investigator	Clive Seligman/Matthew Maxwell-Smith	End Date	12 04 30
Protocol Title	How do people's thinking styles relate to their personality and performance?		
Sponsor	n/a		

This is to notify you that The University of Western Ontario Department of Psychology Research Ethics Board (PREB) has granted expedited ethics approval to the above named research study on the date noted above.

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Investigators must promptly also report to the PREB:

- a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) all adverse and unexpected experiences or events that are both serious and unexpected;
- c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to the PREB for approval.

Members of the PREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the PREB.

Clive Seligman Ph.D.

Chair, Psychology Expedited Research Ethics Board (PREB)

The other members of the 2011-2012 PREB are: Mike Atkinson (Introductory Psychology Coordinator), Rick Goffin, Riley Hinson Albert Katz (Department Chair), Steve Lupker, and TBA (Graduate Student Representative)

CC: UWO Office of Research Ethics

This is an official document. Please retain the original in your files

Appendix I: Ethics Approval, Study 3



Department of Psychology The University of Western Ontario
 Room 7418 Social Sciences Centre,
 London, ON, Canada N6A 5C1
 Telephone: (519) 661-2067 Fax: (519) 661-3961

Use of Human Subjects - Ethics Approval Notice

Review Number	11 06 06	Approval Date	11 06 27
Principal Investigator	Clive Seligman/Matthew Maxwell-Smith	End Date	11 12 31
Protocol Title	What factors affect our performance		
Sponsor	n/a		

This is to notify you that The University of Western Ontario Department of Psychology Research Ethics Board (PREB) has granted expedited ethics approval to the above named research study on the date noted above.

The PREB is a sub-REB of The University of Western Ontario's Research Ethics Board for Non-Medical Research Involving Human Subjects (NMREB) which is organized and operates according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario. (See Office of Research Ethics web site: <http://www.uwo.ca/research/ethics/>)

This approval shall remain valid until end date noted above assuming timely and acceptable responses to the University's periodic requests for surveillance and monitoring information.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the PREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of research assistant, telephone number etc). Subjects must receive a copy of the information/consent documentation.

Investigators must promptly also report to the PREB:

- a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
- b) all adverse and unexpected experiences or events that are both serious and unexpected;
- c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to the PREB for approval.

Members of the PREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the PREB.

Clive Seligman Ph.D.

Chair, Psychology Expedited Research Ethics Board (PREB)

The other members of the 2010-2011 PREB are: Mike Atkinson (Introductory Psychology Coordinator), David Dozois, Vicki Esses, Riley Hinson Albert Katz (Department Chair), and Tom O'Neill (Graduate Student Representative)

CC: UWO Office of Research Ethics

This is an official document. Please retain the original in your files.

Curriculum Vitae

Matthew Maxwell-Smith

EDUCATION

Doctor of Philosophy, Social Psychology	Western University: 2012
Masters of Science, Social Psychology	Western University: 2007
Bachelor of Arts, Honours Social Psychology and Applied Studies	University of Waterloo: 2002

CURRENT RESEARCH INTERESTS

Social dominance motives:

- Causal role of intergroup competition on prejudice and discrimination
- Distinguishing the antecedents and social consequences of competitive perceptions and competitive motivations

Ideology:

- The relation between individual differences in commitment to beliefs and:
 - the tendency for people to follow salient ideological systems;
 - people's reactions toward social stimuli that vary in their perceived belief-system (dis)similarity;
- Relation between system-justification ideologies and consumer psychology

RESEARCH FUNDING & AWARDS

Graduate Research Thesis Award	Western University: 2009-2010; 2010-2011
Student Diversity Travel Award	Society for the Psychological Study of Social Issues: 2010
Graduate Alumni Scholarship	Western University: 2009
Student Travel Award	American Psychological Association: 2009
Diversity Graduate Travel Award	The Society for Personality & Social Psychology: 2008
Dean's Graduate Scholarship in Migration and Ethnic Relations	Western University: 2007
Western Graduate Research Scholarship	Western University: 2006-2010
Clara Mayo Grant	Society for the Psychological Study of Social Issues: 2006
Canada Graduate Scholarship	Social Sciences and Humanities Research Council: 2005-2006
Dean's Honours List	University of Waterloo: 2001-2002
Entrance scholarship	Western University: 1998, declined

PUBLICATIONS

Maxwell-Smith, M. A., & Esses, V. M. (2012). Assessing Individual Differences in the Degree to Which People are Committed to Following Their Beliefs. *Journal of Research in Personality, 46*, 195-209.

SELECT CONFERENCE PRESENTATIONS

Maxwell-Smith, M. A., & Esses, V. M. (2012, June). Assessing Individual Differences in Commitment to Beliefs—A New Measure. *Oral presentation at the Society for the Psychological Study of Social Issues 2012 Biennial Meeting, Charlotte, NC.*

Maxwell-Smith, M. A., & Mattos, M. (2012, June). Competition and Intergroup Bias: Distinguishing Competitive Perceptions from Competitive Motivations. *Poster presented at the Society for the Psychological Study of Social Issues 2012 Biennial Meeting, Charlotte, NC.*

Maxwell-Smith, M. A., & Seligman, C. (2011, January). Applying the Competitive Elements Model to Understand How Competitive Outcomes Affect Evaluations of One's Competitors. *Poster presented at the Society for Personality and Social Psychology 2010 Annual Meeting, San Antonio, TX.*

- Maxwell-Smith, M. A.,** & Seligman, C. (2011, January). The Moderating Role of Individual Differences in Commitment to Beliefs on Religious Intergroup Bias. *Conference Paper presented at the Political Psychology Preconference for the Society for Personality and Social Psychology 2011 Annual Meeting, San Antonio, TX.*
- Maxwell-Smith, M. A.,** & Seligman, C. (2011, January). (How) Is Competition Bad for Us? Preliminary Evidence for the Utility of the Competitive Elements Model in Understanding Hostility toward One's Competitor(s). *Poster presented at the Political Psychology Preconference for the Society for Personality and Social Psychology 2011 Annual Meeting, San Antonio, TX.*
- Maxwell-Smith, M. A.,** Conway, P., & Olson, J. (2010, June). The Moderating Role of Commitment to Beliefs on Environmental Motivation. *Poster presented at the Society for the Psychological Study of Social Issues 2010 Biennial Meeting, New Orleans, LA.*
- Conway, P., **Maxwell-Smith, M. A.,** & Olson, J. (2010, January). Is it Fair to be Green? How Perceptions of the Environment and Past Behaviour Influence Justice Principles and Willingness to Support Ecological Initiatives. *Poster presented at the Society for Personality and Social Psychology 2010 Annual Meeting, Las Vegas, NV.*
- Maxwell-Smith, M. A.,** & Seligman, C. (2010, January). The Origins of Threat Perceptions in Competitive Contexts. *Poster presented at the Society for Personality and Social Psychology 2010 Annual Meeting, Las Vegas, NV.*
- Maxwell-Smith, M. A.,** Conway, P., Cheung, I., & Seligman, C. (2009, June). The Influence of Individual Differences in Commitment to Beliefs on People's Attitudes, Feelings, and Behaviours Related to the 2008 Canadian Federal Election. *Paper presented at the 70th annual Canadian Psychological Association Annual Convention, Montreal, QC.*
- Maxwell-Smith, M. A.** (2002, May). *Cross-cultural cooperation and competition in a social dilemma as a function of self-image threat.* Paper presented at the annual Ontario Honours Psychology Thesis Conference at the Western University.

TEACHING EXPERIENCE

Courses:

- Psychology of People, Work, & Organizations King's University: 2012-current
- Psychology of Persuasion Online Western University: Jan-Apr 2012
- Introduction to Human Sexuality Western University: 2008-2012

Invited guest lectures:

- Stereotypes, Prejudice, and Discrimination King's University: Oct 2011, March 2012
- Scale construction and individual differences Western University: Oct 2011

Teaching awards:

- Nominations for Outstanding Teaching Assistant Award:
 - Research Methods and Statistical Analysis 2009-2010
 - Introduction to Social Psychology 2006-2007
- Certificate of Teaching Excellence from the Council of Canadian Departments of Psychology
 - Research Methods and Statistical Analysis 2009-2010