Does unfairness have a ripple effect?

The impact of independent and interdependent self-construals

by

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

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Abstract

In the present research, I examine whether independent and interdependent self-construals influence behaviour toward innocent others following unfair treatment from an authority. Fairness researchers have documented many negative effects of unfair treatment on recipients' thoughts, feelings, and behaviours. From the recipient's perspective, unfair treatment is a sign that the recipient is inferior and unworthy of respect, leading to decreased self-esteem (e.g., Tyler, Degoey, & Smith, 1996). Although this decrease in self-esteem among recipients of unfair treatment may be universal, individual differences in behavioural reactions to unfairness are evident. Prior research and theory suggest that the need to maintain one's self-esteem is fundamental (e.g., Maslow, 1968; Rogers, 1961; Rosenberg, 1979), and that individuals engage in a wide range of behaviours to maintain their self-esteem (Steele, 1988). Recent research suggests that the types of behaviours individuals use to restore their self-esteem following unfairness vary according to the source of their self-esteem. Specifically, individuals with a stronger independent self-construal, who derive self-esteem from being unique and getting ahead, may be more likely to enact revenge against those who treat them unfairly (Zdaniuk & Bobocel, 2009). Conversely, those with a stronger interdependent self-construal, who derive self-esteem from maintaining harmonious relationships, may be more likely to forgive (Bobocel & Zdaniuk, 2009).

At times, engaging in revenge or forgiveness toward the perpetrator of unfairness may be difficult, especially if the perpetrator is an authority. In these situations, recipients of unfairness may maintain their self-esteem by engaging in unfair or fair behaviours directed toward innocent others. I predicted that after experiencing

unfair treatment from an authority, individuals with a strong (versus weak) independent self-construal would be more likely to act unfairly toward fellow group members, and that individuals with a strong (versus weak) interdependent self-construal would be more likely to act fairly. These predictions were tested in two laboratory studies and one field study. Although the results were not consistent across the three studies, some support was found for both predictions. In addition, the findings are consistent with the notion that self-esteem maintenance was a mechanism underlying the predicted effects of the self-construals. The implications of the current findings for the fairness literature are discussed, and directions for future research are proposed. To avoid ripple effects of unfairness in the workplace, organizational authorities are advised to promote an interdependent, rather than independent, work environment.

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Introduction

Overview of the Current Research

When asked, most people are able to describe a time when they felt unfairly treated. Despite the seemingly universal nature of this experience, it is clear that not all instances of unfairness are equal, nor do all people react to unfairness in the same way. Indeed, depending on the individual and the circumstance, reactions to unfairness have been shown to range widely from emotional upset to horrific acts of revenge against the perpetrator of the unfairness (e.g., Bies, 1987; Bies & Tripp, 1996; Mikula, Scherer, & Athenstaedt, 1998; Scher, 1997). As such, unfairness may be a proverbial "double-edged sword" with negative consequences for everyone involved.

Given the considerable damage that can be caused by victims' negative reactions to unfairness, a great deal of justice research has attempted to increase our understanding of these reactions across a wide variety of situations. Recently, however, interest has shifted from examining the consequences of unfair treatment to understanding the antecedents, or causes, of unfair treatment. Specifically, researchers have begun to examine unfairness as a dependent variable (Bobocel & Zdaniuk, 2005; Folger & Skarlicki, 1998, 2001) in hopes of understanding what motivates people to treat others unfairly rather than fairly. Ultimately, the goal of this body of research is to reduce the incidence of unfair treatment in society and to increase the incidence of fair treatment.

Although there are few studies to date that have investigated the antecedents of unfairness and fairness, most of the prior research that has been conducted in this area has focused on situational factors (e.g., Folger & Skarlicki, 1998; Hodgins, Liebeskind

& Schwartz, 1996). In my dissertation, I expand upon this base and argue that in addition to situational influences, dispositional factors also play an important role in determining whether individuals treat others unfairly or fairly. Specifically, I propose that situational and dispositional factors interact to determine unfair and fair behaviour toward others. In the current research, I focus on the situational factor of past experience with unfairness from an authority, and the two dispositional factors of independent and interdependent self-construals.

It should also be noted that the current research concentrates on displaced unfair and fair behaviour directed toward innocent others. This is in contrast to prior studies, which have focused on situations where the recipient of the unfair treatment has—at least from the actor's perspective—done something to provoke the actor's response. For example, research in organizational psychology has examined factors that prompt managers to behave unfairly when delivering negative feedback to underperforming employees (e.g., Folger & Skarlicki, 1998; Goreham & Bobocel, 2009). Other recent studies have examined the impact of dispositional variables on individuals' tendencies to enact revenge against or forgive perpetrators of an injustice (Bobocel & Zdaniuk, 2009; Zdaniuk & Bobocel, 2009). Rather than focusing on situations where actors respond unfairly or fairly to actions taken by the recipient, the present research examines unfair and fair behaviour directed toward innocent others whose actions are unrelated to the treatment they receive.

In the sections that follow, I first provide a brief review of what is meant by the terms "unfairness" and "fairness." Second, I argue why an individual's own past experience with unfairness may influence their subsequent behaviour. Third, I describe

the role that self-esteem may play in the relation between past experience with unfairness and subsequent behaviour. Next, I introduce the concepts of independent and interdependent self-construals and discuss how they may interact with an individual's past experience with unfairness to influence their behaviour toward innocent others. Finally, I present an overview of the hypotheses that are tested in the current research.

A Brief Look at Unfairness

Although a detailed review of the evolution of the justice concept is beyond the scope of this dissertation (for reviews, see Colquitt, Greenberg, & Zapata-Phelan, 2005; Miller, 2001), a brief description of what is meant by the terms "unfairness" and "fairness" as they apply to the current research is appropriate. As organizational justice researchers continue to debate about the best way to characterize fairness as a construct, it appears that the literature has gravitated toward a model comprising four "facets" of fairness—and unfairness—that matter to people (Colquitt, 2001; Greenberg, 1993; for an opposing view see Bobocel & Holmvall, 2001). Contemporary theorists have suggested that a common thread underlying each of these four facets is the individual's concern that they receive the outcomes and treatment they are entitled to as a contributing member of society and a human being who is worthy of respect (see Miller, 2001).

Distributive justice (Adams, 1965) refers to the fairness of the allocation of outcomes that people receive (i.e., a year-end bonus at work). Specifically, people feel fairly treated when their outcomes are consistent with their expectations about what they should receive. These expectations are usually based on allocation norms, such as equity (i.e., high performers receive a larger bonus), equality (i.e., all employees

receive the same bonus), or need (i.e., employees with larger families receive a larger bonus). When allocation norms are violated and people receive less than they expected or feel they deserve, they will generally report feeling unfairly treated.

Procedural justice (Leventhal, 1980; Lind & Tyler, 1988; Thibaut & Walker, 1975) refers to the fairness of the procedures used to arrive at the aforementioned outcomes. Numerous criteria have been identified as being important for perceptions of procedural justice. For example, people feel more fairly treated when given the chance to voice their opinions about decisions that affect them, when given the opportunity to influence decisions that affect them, when decision makers are unbiased, when rules are applied consistently, when decisions are based on accurate information, and when the decision process upholds ethical and moral standards (Leventhal, 1980; Thibaut & Walker, 1975). In contrast, people feel unfairly treated when one more of these criteria are violated during the decision-making process.

The concept of interactional justice was originally introduced by Bies and Moag (1986) to describe the fairness of the interpersonal treatment people receive during the delivery of outcomes. In subsequent work, Greenberg (1993) distinguished between interpersonal and informational justice, which have since been treated by some researchers as two separate facets of interactional justice (Colquitt, 2001). Perceptions of interpersonal justice are fostered by respectful, polite, and proper treatment during the delivery of an outcome. By contrast, people feel unfairly treated when they encounter disrespectful, rude, or inappropriate interpersonal treatment. Perceptions of informational justice are created when authorities provide adequate information about outcomes and procedures. This may include giving reasonable explanations for

decisions, as well as being transparent and honest about outcomes and procedures that affect the recipient. It follows that people feel unfairly treated when authorities fail to provide adequate information about how outcomes were allocated, or how procedures were conducted.

Although a relatively clear distinction is made in the organizational justice literature between distributive and procedural fairness, the same cannot be said for the distinction between procedural and interactional fairness. Despite the fact that most researchers acknowledge interactional fairness as a meaningful construct, and that interactional and procedural fairness appear to have different antecedents and consequences, it remains unclear whether interactional (and hence, interpersonal and informational) fairness represents anything more than the social aspect of procedural fairness (for a review of this debate, see Bobocel & Holmvall, 2001).

Aside from this debate, many researchers believe that violations of procedural, interpersonal, and informational fairness norms may be viewed as unfair outcomes in their own right, regardless of whether they occur during the delivery of another outcome (Cropanzano & Ambrose, 2001; Greenberg, 1993; Lind & Tyler, 1988; Miller, 2001). Specifically, it has been argued that in general people expect, and feel that they deserve, to be treated with propriety, honesty, respect, and dignity in their daily social interactions. Given these expectations, when people encounter unfair procedures or dishonest, disrespectful, or otherwise rude treatment, they are likely to feel unfairly treated even when there is no other outcome involved (but see Heuer, Blumenthal, Douglas, & Weinblatt, 1999 for a different view).

As mentioned previously, a common thread underlying each of these facets of fairness is individuals' concern with receiving that which they believe they deserve, be it outcomes, procedures, or proper treatment.[1] In the current research, I am interested in whether experiencing unfairness causes individuals to behave unfairly or fairly toward innocent group members, regardless of which facets of fairness—distributive, procedural, interpersonal, or informational—are violated (by unfair behaviour) or upheld (by fair behaviour). As such, the methods and measures used in the current studies manipulate and assess numerous facets of unfairness and fairness.

Effects of Unfairness on Group-Directed Behaviour

Given that justice research has traditionally focused on examining the consequences of unfair treatment, research examining the antecedents of unfair behaviour remains scarce. To my knowledge, only a small number of studies to date have attempted to examine predictors of unfairness, and most have focused on the situational factor of blameworthiness. For example, the results of a scenario study by Folger and Skarlicki (1998) revealed that individuals who were to blame for a negative outcome were more likely to endorse behaviours that violated principles of procedural, interpersonal, and informational fairness (i.e., spending less time explaining the negative outcome to the recipient) than those who were not to blame. Similarly, a scenario study by Hodgins et al. (1996) indicated that blameworthiness was associated with offering less interpersonally fair explanations to the recipient of the negative

[1] Overwhelmingly, the organizational justice literature has focused on situations involving under-reward, in which outcomes, procedures, or treatment are perceived by recipients as falling short of their expectations or what they feel they deserve. However, research has shown that individuals who receive outcomes, procedures, or treatment that surpass their expectations or what they feel they deserve may feel over-rewarded, and thus, unfairly treated (Walster, Walster, & Berscheid, 1978). In the present research, I use the term "unfairness" to refer to situations involving under-reward, rather than over-reward.

outcome. Although blameworthiness may be an important factor in predicting unfairness, no follow-up research has been conducted to support these findings, or to attempt to identify additional situational factors that may influence unfair behaviour.

In the current research, I attempt to fill this void in the literature by examining another situational factor that may influence individuals' unfair and fair behaviours toward others. Specifically, I propose that an individual's own past experience with unfairness may play an important role in determining whether their behaviour is unfair or fair. Despite the fact that no research to date has directly examined the impact of past experience with unfairness on an individual's propensity to act unfairly or fairly toward others, I will argue that this notion is consistent with several justice theories, as well as a few recent studies.

The group-value (Lind & Tyler, 1988; Tyler, Degoey, & Smith, 1996) and relational (Tyler & Lind, 1992) models of fairness propose that unfair and fair treatment from group authorities impacts a recipient's group-directed behaviour, as well as their self-esteem. According to the group-value model, experiencing fair treatment from group authorities communicates that the recipient is a valued member of the group and allows the recipient to feel pride about belonging to a group that treats its members fairly. Recipients of fair treatment who feel respected by fellow group members and take pride in their group are likely to internalize the group's interests as their own, leading them to engage in positive group-directed behaviours that maintain a favourable identity for the group and ultimately, themselves (Tyler & Blader, 2003). Drawing on social identity theory (Tajfel & Turner, 1986), the group-value model also proposes that

recipients of fair treatment should experience high levels of self-esteem as a by-product of feeling respected by, and proud of, their group.

More relevant to the current research, however, are the negative effects that unfair treatment by group authorities can have on group members. First, unfair treatment communicates that the recipient is a low-status group member. In addition, recipients of unfair treatment may be unlikely to take pride in their group membership when they realize that their group treats its members unfairly. As a result, recipients of unfair treatment should be unlikely to internalize the group's interests as their own, making them unlikely to engage in positive group-directed behaviours. Finally, because unfairly treated group members feel disrespected by other group members and lack pride in their group, their self-esteem may suffer.

Consistent with the predictions of the group-value model, research shows that recipients of fair treatment from authorities experience increased self-esteem and display more group-directed positive behaviour, while recipients of unfair treatment experience decreased self-esteem and display less group-directed positive behaviour (Tyler & Blader, 2003; Tyler et al., 1996; Smith & Tyler, 1997; Smith, Tyler, Huo, Ortiz, & Lind, 1998). Although unfairness and fairness-related behaviours have not been cited as outcomes in research testing the group-value model, it seems reasonable that group-directed behaviour would include unfair and fair behaviour directed toward one's group members. Thus, the notion that an individual's past experience with unfairness may influence their own unfairness and fairness toward fellow group members is consistent with the group-value model.

Additional support for the idea that past experience with unfairness may influence an individual's subsequent unfairness or fairness toward innocent others comes from a few prior studies examining related phenomena. In a recent study, Mitchell and Ambrose (2007) found that employees who had encountered abusive supervision from their managers were more likely to engage in interpersonal deviance. This interpersonal deviance was directed not only at supervisors, but also at innocent co-workers. The abusive supervision measure used in this study comprised items assessing managers' disrespectful and overly negative interpersonal treatment of employees, behaviours that are considered hallmarks of interactional unfairness (Colquitt, 2001; Greenberg, 1993). In addition, the items assessing interpersonal deviance directed at co-workers also appeared to tap aspects of interactional unfairness. Although all measures were based on self-report data and the design was cross-sectional, the results of this study suggest that employees who experience unfair treatment from their manager may be more likely to treat their co-workers unfairly.

Also relevant is an earlier study by Wiesenfeld, Brockner, and Thibaut (2000), which found that managers who had experienced procedural unfairness in their organization were perceived as less effective managers by their subordinates. Despite the fact that the dependent variable in this study was labelled "manager effectiveness," several aspects of this construct were closely related to procedural and interactional fairness (i.e., allowing subordinates to voice their opinions, engaging in open communication with subordinates). Therefore, the data suggest that managers who experienced unfairness in their organization may have in turn treated their subordinates less fairly than those who did not experience unfairness.

In summary, although no studies to date have examined the impact of prior experiences with unfairness on dependent variables specifically designed to assess unfair and fair behaviour toward innocent group members, this hypothesis is grounded in theory and prior research. As such, the current research directly examines the impact of unfairness from an authority on an individual's subsequent unfair and fair behaviour toward innocent others. Importantly, the present research improves upon the self-report and correlational designs used in these prior studies by employing a combination of experimental and correlational methods, as well as using behavioural and third-party measures to assess unfair and fair behaviour.

Why Does Unfairness Influence Behaviour? The Role of Self-Esteem

In addition to examining the relation between group members' past experiences with unfairness and subsequent unfair and fair treatment of others, the current research attempts to shed light on *why* this connection might exist. Specifically, I investigate self-esteem as a potential mechanism underlying the effect of past experience with unfairness on unfair and fair treatment of others.

As mentioned previously, the group-value model and social identity theory (Lind & Tyler, 1988; Tajfel & Turner, 1986; Tyler et al., 1996) propose that recipients of fair treatment from group authorities experience high self-esteem as a by-product of feeling respected by fellow group members and being part of a group that treats its members fairly. By contrast, recipients of unfair treatment from authorities experience low self-esteem as a result of feeling disrespected and being part of a group that treats its members unfairly. Independent of these effects on self-esteem, the group-value model suggests that past experience with unfairness and fairness from authorities

affects recipients' propensities to engage in positive group-directed behaviours by influencing recipients' feelings of group identification.

Despite the group-value model's predictions that self-esteem and group-directed behaviours are independently influenced by past fairness-related experiences with authorities, there is evidence to suggest that self-esteem may actually mediate the relation between fairness-related experiences and group-directed behaviours. Recall that Wiesenfeld et al. (2000) found that managers who experienced unfairness in their organization may have engaged in less effective and less interactionally fair behaviour as reported by their subordinates. In addition, they found that managers who experienced unfairness in their organization reported decreased self-esteem. Although these findings are consistent with the group-value model, the authors also hypothesized that self-esteem would mediate the relation between managers' perceptions of unfairness in the organization and their subsequent behaviour toward subordinates. They reasoned that individuals who encounter a threat to their self-esteem typically respond in a self-protective manner, which may include withdrawing from social situations (Folger & Skarlicki, 1998) and derogating innocent others (Fein & Spencer, 1997). As such, they proposed that managers who experienced the greatest threat to their self-esteem after encountering unfairness in the organization would display less effective (and potentially less fair) behaviour toward employees as part of a general self-protection mechanism. The results supported this hypothesis.

It should be noted that the Wiesenfeld et al. (2000) study, like other studies testing the group-value model (e.g., Smith & Tyler, 1997; Tyler et al., 1996), examined the presence or absence of group-directed *positive* behaviour following fair and unfair

treatment from authorities, rather than the presence or absence of group-directed *negative* behaviour. Clearly, the absence of positive or fair behaviour is not synonymous with the presence of negative or unfair behaviour. Thus, it remains to be seen whether the mediating effects of self-esteem also apply to group-directed negative behaviour such as that examined by Mitchell and Ambrose (2007). Research does suggest that individuals under self-esteem threat may engage in negative behaviours directed toward innocent others who are *not* group members. Specifically, Fein and Spencer (1997) found that individuals whose self-esteem had been threatened by negative feedback were able to restore their self-esteem by derogating an innocent other, who belonged to a stereotyped group. Although the innocent other who was subject to derogation was technically an out-group member, Fein and Spencer (1997) argued that in-group/out-group dynamics were not responsible for their findings. Therefore, it seems plausible that self-esteem threat may both inhibit positive behaviour and promote negative behaviour directed toward innocent others in one's own group.

Based on this prior research, it seems reasonable to conclude that individuals who encounter unfair treatment from group authorities may act in negative and potentially unfair ways in an attempt to protect their own self-esteem. Therefore, the current research will test the validity of the assumption that self-esteem is a mechanism behind the relation between prior unfair treatment and subsequent unfair and fair behaviour toward innocent others.

Independent and Interdependent Self-Construals

In addition to the situational antecedent of prior unfair treatment, there is reason to believe that individual differences play a significant role in determining unfair and

fair behaviour toward innocent others. In a prior study, Goreham and Bobocel (2009) found that managers' dispositional tendencies to focus on their own needs versus the needs of others during social interactions significantly impacted their interactional unfairness and fairness.

Another related set of individual difference variables that may have an important impact on unfairness and fairness toward others is the actor's independent and interdependent self-construals. In the three decades that have passed since Hofstede's (1980) seminal work on cultural values, research examining cultural differences in how people think, feel, and behave in social situations has flourished. Although Hofstede (1980) identified five value dimensions along which different cultures seemed to vary, his individualism-collectivism dimension has received the most research attention by far.

As conceptualized by Hofstede (1980), individualistic cultures are marked by loose interpersonal ties, such that people are expected to look out for their own interests and the interests of their immediate families only. In individualist cultures, personal rights, autonomy, and self-fulfillment are emphasized. In contrast, collectivistic cultures are characterized by strong interpersonal ties. In these cultures, group loyalty, cohesion, and the fulfillment of group goals are paramount. Hofstede (1980) originally described individualism-collectivism as a culture-level rather than individual-level variable, and assumed that individualism and collectivism represented opposite ends of the same continuum.

Subsequent research by Triandis and his colleagues demonstrated that individualism and collectivism could be measured as individual-level constructs

(Triandis, Bontempo, Villareal, Asai, & Lucca, 1988), and also that they should be treated as separate dimensions (Triandis, 1995; Triandis et al., 1986). At the individual level of analysis, Triandis described individualism as the tendency to give priority to personal goals over group goals, and to behave in ways that are based on personal attitudes rather than group norms. Collectivism, on the other hand, was described as the tendency to give priority to group goals over personal goals, and to allow one's behaviour to be shaped by group norms and the need to maintain harmonious social relationships.

In another major theoretical development, Markus and Kitayama (1991) highlighted the influence of individualistic and collectivistic values on individuals' self-representations, or "self-construals." Specifically, they proposed that members of individualistic cultures develop an independent self-construal in which the self is viewed as unique and separate from others. For these individuals, feelings of self-esteem are derived from expressing the true self and validating one's own internal attributes. By contrast, Markus and Kitayama (1991) proposed that members of collectivistic cultures develop an interdependent self-construal in which the self is viewed as being connected to others. For these individuals, self-esteem is derived from maintaining harmonious social relationships and fitting in with the group.

Building upon Markus and Kitayama (1991) and Triandis' (Triandis, 1995; Triandis et al., 1986; Triandis et al., 1988) work, Singelis (1994) developed a measure to assess individual differences in the independent and interdependent self-construals. As expected, participants from individualistic cultures generally scored higher on the independent self-construal subscale than participants from collectivistic cultures, and

participants from collectivistic cultures generally scored higher on the interdependent self-construal subscale than participants from individualistic cultures. Notwithstanding this general cultural pattern, Singelis (1994) proposed that individuals in individualistic and collectivistic cultures possess both an independent and an interdependent self, and that the two dimensions are orthogonal. Specifically, Singelis (1994) argued that the two selves differ in the extent to which they are developed and sampled by situations that regularly arise in one's culture, such that one or both selves can be strong or weak. As a result, which self is applied in a particular circumstance may depend on the relative strengths of the two selves as well as relevant situational cues (see also Triandis, 2001). This prediction has been borne out in research demonstrating that the independent and interdependent selves can be primed experimentally (Gardner, Gabriel, & Lee, 1999; Trafimow, Triandis, & Goto, 1991).

Effects of Independent and Interdependent Self-Construals on Group-Directed Behaviour

Since the development of Singelis' (1994) Self-Construal Scale, researchers have observed many consequences of the independent and interdependent self-construals on individuals' thoughts, feelings, and behaviours, including group-directed behaviours. For example, Oetzel (1998) examined the impact of self-construals and cultural background on conflict styles in a small group setting. The results showed that individuals with a strong independent self-construal tended to use dominating interpersonal strategies, whereas individuals with a strong interdependent self-construal tended to use cooperative and compromising interpersonal strategies. Notably,

participants' independent and interdependent self-construals were found to be better predictors of behaviour than cultural background.

Research by Sedikides, Gaertner, and Toguchi (2003) has also shown that independent and interdependent self-construals predict the types of behaviours that individuals engage in to enhance their self-esteem. Sedikides et al. (2003) found that individuals with a strong independent self-construal were more likely to use individualistic behavioural styles (i.e., engaging in conflict with one's group, putting their own needs before the needs of their group) to maintain positive self-esteem. In contrast, individuals with a strong interdependent self-construal were more likely to use collectivistic behavioural styles (i.e., following group norms, avoiding conflict) to maintain positive self-esteem. These findings are, of course, consistent with Markus and Kitayama's (1991) notion that individuals with a strong independent self-construal derive their self-esteem from self-expression and being unique, whereas individuals with a strong interdependent self-construal derive their self-esteem from maintaining social harmony and fitting in.

Recent research also shows effects of the self-construals on behavioural styles and self-esteem in conflict situations caused by unfairness. In one series of studies, Zdaniuk and Bobocel (2009) examined the effects of independent self-construal on revenge behaviour by leading participants to believe that a fellow group member had evaluated them unfairly. The results indicated that although most participants experienced self-esteem threat in response to the unfairness, individuals with a strong independent self-construal were more likely to restore their self-esteem by enacting revenge against the offending group member than individuals with a weak independent

self-construal. A second series of studies revealed that individuals with a strong interdependent self-construal were more likely to restore their self-esteem through forgiveness than individuals with a weak interdependent self-construal (Bobocel & Zdaniuk, 2009).

It should be noted that behavioural responses toward group members who have committed an unfair act may be very different from behavioural responses toward authorities who have acted unfairly. This is because it may be more risky to enact revenge against a perpetrator who is an authority than a perpetrator who is an equal-status group member. For example, an employee in an organization who engages in revenge against an authority may risk losing their job if their act of revenge is discovered. In such cases, employees may find other ways to restore their damaged self-esteem, such as acting out toward innocent co-workers. Indeed, Mitchell and Ambrose (2007) found that employees who encountered abusive and unfair treatment from their supervisors engaged in more deviant and unfair behaviours directed at co-workers.

As previously discussed, a strong independent self-construal has been shown to increase the use of dominating interpersonal strategies (Oetzel, 1998), individualistic behavioural styles (Sedikides et al., 2003), and revenge (Zdaniuk & Bobocel, 2009). It also seems plausible that a strong independent self-construal may increase the use of unfair behaviour directed toward innocent others in situations where confronting the perpetrator of an unfairness is not a viable option. Because individuals with a strong independent self-construal are motivated by their own needs and derive feelings of self-esteem from self-expression (Markus & Kitayama, 1991), and at times self-assertion

(Oetzel, 1998; Singelis, Triandis, Bhawuk, & Gelfand, 1995), they may be more likely than those with a weak independent self-construal to respond to self-esteem threat by asserting their dominance and by derogating others. One way to accomplish self-esteem restoration may be to treat others unfairly. According to the group-value model, unfair treatment communicates that the recipient is a low status group member who is not worthy of respect (Lind & Tyler, 1988; Smith & Tyler, 1997; Smith et al., 1998; Tyler et al., 1996). Thus, following unfair treatment from a group authority, individuals with a strong independent self-construal may attempt to restore their sense of self by treating fellow group members unfairly.

I have argued that although individuals with a strong independent self-construal may be inclined to confront or enact revenge against the perpetrator of an unfair act, behaving unfairly toward innocent others may at times be a more practical option for restoring their self-esteem. As previously mentioned, individuals with a strong interdependent self-construal may be more inclined than those with a weak interdependent self-construal to engage in forgiveness or other relationship-maintaining behaviours toward a perpetrator when their self-esteem is threatened (Bobocel & Zdaniuk, 2009; Oetzel, 1998; Sedikides et al., 2003). However, just as revenge against the perpetrator may not always be possible, these individuals may encounter situations where responding to unfairness with forgiveness or other pro-social behaviours aimed at the perpetrator is difficult or even inappropriate, as described below.

Forgiveness has been defined as a transformation whereby motivations to seek revenge and maintain distance from the offender decrease, and the motivation to engage in conciliatory action increases (McCullough, Worthington, & Rachal, 1997). Taking

this focus on motivation a step further, researchers often measure behavioural intentions, as well as actual behaviours, that express a desire to restore the relationship as indicators of forgiveness (e.g., Bobocel & Zdaniuk, 2009; McCollough et al., 1997). Although intended and actual behaviours toward the perpetrator appear to be important aspects of forgiveness, engaging in such behaviours may present a challenge, especially in the workplace. For example, employees may have limited contact with managers who have treated them unfairly, reducing the opportunity to engage in conciliatory actions. Alternatively, behaviours aimed at restoring the damaged relationship may be deemed inappropriate in situations where there is a large power distance between the employee and manager, or when the manager is hostile to such advances.

Given that individuals with a strong interdependent self-construal are more likely to engage in forgiveness toward offending group members (Bobocel & Zdaniuk, 2009), I propose that they may engage in displaced actions that reinforce their social connections with group members when they are unable to enact forgiveness toward the perpetrator of unfairness. Prior research and theory have shown that the behaviour of individuals with a strong interdependent self-construal is shaped by group norms and relationship-maintenance goals. Indeed, these individuals identify themselves in terms of their relationships with others and derive their self-esteem from maintaining these relationships (Markus & Kitayama, 1991). Following unfair treatment from an authority, individuals with a strong interdependent self-construal may therefore attempt to restore their self-esteem by upholding group norms, such as justice, or behaving in self-effacing ways that serve the needs of other group members. As such, individuals with a strong interdependent self-construal may be more likely than individuals with a

weak interdependent self-construal to behave fairly, or even altruistically[2,3], toward other group members after experiencing unfairness from a group authority.

In summary, there is good reason to believe that individuals' past experiences with unfairness from group authorities may interact with individual differences in independent and interdependent self-construals to predict behaviours toward innocent others, and that self-esteem may be a mechanism underlying the expected effects. The goal of my dissertation is to test these ideas.

Overview of the Studies

I conducted three studies to examine a) whether individuals with a strong independent self-construal are more likely than those with a weak independent self-

[2] Altruism has been defined as "a motivational state with the ultimate goal of increasing another's welfare," and has been contrasted with egoism, which is defined as "a motivational state with the ultimate goal of increasing one's own welfare" (Batson, 2002). According to Batson (1990; 2002), behaviours that benefit another person may be motivated by either altruism or egoism, depending on the ultimate goal of the behaviour. In the current research, I have argued that individuals with a strong interdependent self-construal may be motivated to engage in behaviours that benefit other group members at the expense of the self as a way to restore their own damaged self-esteem. Because the *ultimate* goal of these behaviours is to benefit the self, rather than others, it follows that these behaviours may be viewed as egoistically, rather than altruistically, motivated. Indeed, from this perspective, any behaviour (including unfair and fair behaviour) that is used to restore self-esteem following unfair treatment may be viewed as egoistically motivated. Although the term "altruism" may be somewhat of a misnomer in the context of the current studies, it is used here to help distinguish among three types of egoistic behaviours that are likely—at least from the recipient's perspective—to be viewed as unfair, fair, and "altruistic."

[3] As mentioned previously, individuals may feel unfairly treated when they receive treatment or outcomes that surpass their expectations, or that are beyond what they feel they deserve (Walster, Walster, & Berscheid, 1978). It follows that in the current studies, recipients of "altruistic" behaviour may perceive that they have done nothing to deserve this treatment, causing them to feel unfairly treated. Despite this logic, research has shown that individuals often feel they deserve more favourable outcomes and treatment than others feel they deserve (e.g., Messick & Sentis, 1979; Ross & Sicoly, 1979; Thompson & Lowenstein, 1992), suggesting that the threshold for unfairness perceptions resulting from over-reward is less sensitive than the threshold for under-reward. In addition, I would argue that in the context of the current research, "altruistic unfairness" is quite distinct from "negative unfairness," but quite similar to fairness. Specifically, behaviours that display "altruistic unfairness" and fairness (i.e., enhancing relationships with group members and upholding valued group norms) are similar routes for achieving the ultimate goal of self-esteem restoration, and both of these routes are in sharp contrast to behaviours that display "negative" unfairness (i.e., asserting the self and derogating others) to achieve the same goal. Therefore, I use the term "altruism" to refer to behaviour that may in extreme circumstances be perceived as unfair, but is generally pro-social and positive for the recipient.

construal to behave unfairly toward a fellow group member after being treated unfairly by an authority, and b) whether individuals with a strong interdependent self-construal are more likely than those with a weak interdependent self-construal to behave fairly or altruistically toward a fellow group member following unfair treatment from an authority. In two of these studies, I tested the validity of the assumption that self-esteem is a mechanism underlying both of these predicted effects.

In Study 1, I used an involving laboratory paradigm to observe participants' unfair, fair, and altruistic behaviours toward group members following unfair treatment from the experimenter. In Study 2, I sought to replicate and extend the results of Study 1 by introducing a control condition and using a slightly different dependent measure to assess participants' unfair, fair, and altruistic behaviours toward fellow group members. In Study 3, I moved beyond the laboratory paradigm to examine the generalizability of the predicted effects in a field setting using pairs of graduate students as participants.

Study 1

Study 1 was conducted as an initial investigation of the effects of the self-construals on participants' unfair, fair, and altruistic behaviours toward an innocent group member (i.e., a fellow participant) after experiencing unfair treatment from an authority (i.e., the experimenter). As such, I predicted that:

Hypothesis 1

Participants with a strong independent self-construal will be more likely to act unfairly toward a group member after experiencing unfairness from an authority than participants with a weak independent self-construal.

Hypothesis 2

Participants with a strong interdependent self-construal will be more likely to act fairly or altruistically toward a group member after experiencing unfairness from an authority than participants with a weak interdependent self-construal.

In Study 1, I tested the validity of the assumption that self-esteem is a potential mechanism underlying the predicted effects of the independent and interdependent self-construals on unfair, fair, and altruistic behaviour toward a fellow group member. Although mediation analyses have been a common tool for testing similar mechanisms in past research (Baron & Kenny, 1986), self-esteem was *not* expected to mediate the predicted effects in Study 1. Research and theory suggest that the need to maintain positive self-regard is both fundamental and universal (e.g., Markus & Kitayama, 1991; Maslow, 1968; Rogers, 1961; Rosenberg, 1979; Sedikides et al., 2003), and that self-esteem is threatened by unfair treatment (Lind & Tyler, 1988; Smith et al., 1998; Tajfel & Turner, 1986; Tyler & Blader, 2003; Tyler et al., 1996; Zdaniuk & Bobocel, 2009).

As such, I did not expect participants' independent and interdependent self-construals to predict self-esteem threat following unfairness from the experimenter. Rather, I expected that all participants would experience lowered self-esteem as the result of unfair treatment from the experimenter, regardless of their levels of independent and interdependent self-construal. In addition, I expected that all participants would be motivated to engage in actions to restore their damaged self-esteem. Therefore, rather than testing self-esteem as a mediator, changes in participants' self-esteem were observed throughout the study. It was hypothesized that:

Hypothesis 3

For all participants, state self-esteem will drop following unfair treatment but will recover after participants have restored their self-esteem by being unfair, fair, or altruistic toward a group member.

Method

Participants

Participants were 46 undergraduates (20 male, 26 female) at the University of Waterloo. Of this sample, 8 people participated for course credit while 38 were paid $8 in exchange for their participation. The average age was 22 years (*SD* = 3.17). Due to the deception involved in the study, participants were probed for suspicion and thoroughly debriefed at the end of each session. Based on information collected during this debriefing, the data from 12 participants were excluded from the analyses due to suspicion about critical aspects of the study. The data from an additional participant who misunderstood the study instructions were also excluded. Of the 33 participants whose data were retained (15 male, 18 female), 4 participated for course credit and 29 were paid. The average age of this final sample was 21 years (*SD* = 1.08).

Procedure

Assessment of self-construals. Although the distinction between individualism and collectivism and the parallel distinction between independent and interdependent self-construals are well-established in the literature, some researchers further distinguish between "horizontal" and "vertical" aspects of individualism and collectivism (Singelis et al., 1995). This cultural dimension describes differences in the acceptance of inequality, and is carried over into individuals' self-construals.

Individuals with a strong horizontal independent self-construal view the self as unique and separate from others, and perceive all individuals as being more or less equal in status. Individuals with a strong vertical independent self-construal also view the self as unique and separate from others, but perceive status differences among

individuals. As a result, individuals with a strong vertical independent self-construal tend to adopt a competitive orientation in their social relationships (Singelis et al., 1995). In addition, the combination of individualistic values with acceptance of inequality suggests that individuals with a strong vertical independent self-construal may be particularly likely to base their self-esteem on getting ahead and being "the best" (Triandis, 2001). Consistent with this prediction, Zdaniuk and Bobocel (2009) found that individuals with a strong vertical independent self-construal were more likely than those with a weak vertical independent self-construal to engage in revenge as a way to restore their self-esteem following an unfair event.

Earlier, I argued that individuals with a strong independent self-construal would be more likely than those with a weak independent self-construal to assert their dominance over fellow group members after being treated unfairly by an authority as a way to restore their damaged self-esteem. However, given that the vertical aspect of independent self-construal drives the motivation to get ahead and assert the self over others, it follows that vertical independent self-construal is most relevant when predicting unfairness directed toward fellow group members.

A similar distinction has been made between horizontal and vertical interdependent self-construal. Individuals with a strong horizontal interdependent self-construal view the self as connected to others, and view all members of their group as being roughly equal in status. Individuals with a strong vertical interdependent self-construal also view the self as being connected to others, but recognize status differences among group members (Singelis et al., 1995). Compared to the distinction between horizontal and vertical independent self-construal, the distinction between

horizontal and vertical interdependent self-construal has received weaker empirical support (Singelis et al., 1995). Indeed, it may be that the common goal of relationship maintenance held by individuals with a strong interdependent self-construal is a better predictor of interpersonal behaviour in conflict situations than differences in concerns with status. Therefore, no distinction was made in the current research between horizontal and vertical interdependent self-construals.

Approximately one month prior to the study, participants' independent and interdependent self-construals were assessed using an online questionnaire that was part of a larger mass-testing survey. The 20-item questionnaire used in the current study was adapted from Singelis' (1994) Self-Construal Scale and Singelis et al.'s (1995) Individualism-Collectivism Scale. Interdependent self-construal was measured using 12 items taken from both scales. Example items are: "It is important for me to maintain harmony with my group" and "My happiness depends on the happiness of those around me." Singelis' et al.'s (1995) eight-item subscale was used to assess vertical independent self-construal. Example items are: "It annoys me when other people perform better than I do" and "It is important that I do my work better than others." All items were rated on a 7-point scale (where 1 = strongly disagree, 7 = strongly agree). Reliability analyses revealed that although the interdependent self-construal subscale showed excellent internal consistency reliability (Cronbach's $\alpha = .81$), the internal consistency of the independent self-construal subscale could be improved by removing a single reversed-coded item ("Some people emphasize winning; I'm not one of them"). As such, the revised version of the independent self-construal subscale was adopted for the current study (Cronbach's $\alpha = .78$). Consistent with theory and past research,

participants' independent and interdependent self-construals were uncorrelated in the Study 1 sample, $r(28) = .11$, $p = .56$. See Appendix A for a list of all of the independent and interdependent self-construal items.

Main study. A random sample of participants who completed the independent and interdependent self-construal measures during mass-testing was contacted via email or phone and invited to participate in two ostensibly unrelated laboratory studies being run by two different experimenters (hereafter identified as "Study A" and "Study B"). Both experimenters were blind to participants' independent and interdependent self-construals.

The laboratory procedure used in Study A was adapted from Zdaniuk & Bobocel (2009). Participants were brought into the laboratory in pairs. To bolster the cover story that the two studies were unrelated, participants were asked to sign two separate consent forms, and it was explained that two different experimenters would be conducting Study A and Study B. Participants were led to believe that the purpose of Study A was to examine whether people make better decisions in a group or individually. As part of the cover story, participants were told that half of the participants were randomly selected to work on a decision-making task by themselves whereas the other half were selected to work as a group. All participants were then informed that they had been selected to work as a group.

Given the focus of the current research on *group*-directed unfair, fair, and altruistic behaviour following the experience of unfairness from an authority, a number of steps were taken to ensure that participants did in fact perceive themselves to be a group. Past research has shown that merely telling people they are part of a group is

sufficient to elicit behavioural effects consistent with group membership, even in the absence of any categorization criteria or similarities among group members (Billig & Tajfel, 1973). Therefore, in the current study, the fact that participants would be working as a group on the decision-making task was repeated several times by the experimenter, and again on the information consent form for Study A. In addition, both experimenters continued to refer to participants as a "partners" throughout Study A and B.

Before beginning the decision-making task, participants completed a questionnaire assessing their baseline state self-esteem (see *Measures* section). Upon completing this questionnaire, participants completed the decision-making task together while being observed by the experimenter. This was a 10-minute time-pressured in-basket exercise during which participants were asked to place themselves in the role of a manager and deal with a customer complaint. Following the decision-making task, it was explained that the experimenter would provide each participant with private feedback about their performance on the decision-making task. Participants were led to believe that this was being done to promote learning about their strengths and weaknesses. While the experimenter prepared these evaluations, participants were shown to separate rooms where they would remain for the rest of the session. Upon arriving at their separate rooms, participants were asked to evaluate each other's performance, and were assured that these partner evaluations would be kept private.

After participants had evaluated each other's performance, the experimenter gave each participant the same fictitious written performance evaluation. This performance evaluation was delivered in private, and was designed to violate several

fairness principles and thus be perceived as unfair. It should be noted that not all negative outcomes are perceived as unfair. Research indicates that negative feedback can be perceived as either constructive and fair, or destructive and unfair, depending on how it is delivered (Baron, 1993). According to Baron (1993), feedback is characterized as being unfair when it is overly harsh, untimely, too general to be helpful, or delivered in such a way that the recipient is unable to respond to the feedback. Indeed, receiving feedback that is overly negative given the circumstances may trigger perceptions that allocation norms of distributive justice have been violated (Adams, 1965). In addition, feedback that is negative as well as harsh may create a perception that one has been treated disrespectfully, violating norms of interpersonal fairness (Bies & Moag, 1986; Greenberg, 1993). Furthermore, an untimely or otherwise uninformative communication is likely to violate perceptions of informational justice (Greenberg, 1993), and denying recipients the opportunity to voice their opinion in the face of a negative outcome is a hallmark of procedural injustice (Thibaut & Walker, 1975).

In the current study, several of these elements were incorporated into the experimenter's evaluation. Participants were not informed that they would be receiving an individual evaluation until after the in-basket exercise was complete. In addition they were given no information about how they would be evaluated prior to the evaluation, nor were they given an opportunity to discuss the evaluation with the experimenter. Finally, the content of the evaluation was quite negative, as well as overly harsh, given the circumstances. Specifically, participants were led to believe that based on the short 10-minute task they had just completed the experimenter had rated them as somewhat unprofessional and a below-average performer. See Appendix B for

a copy of the fictitious experimenter evaluation. Once participants had been given a chance to look over the experimenter's evaluation, they completed a second questionnaire assessing their state self-esteem as well as their perceptions of the experimenter's evaluation (see *Measures* section).

At this point, participants were told that Study A was over and the second experimenter was brought in to begin Study B. The procedure for Study B was adapted from Batson, Klein, Highberger, and Shaw (1995).[4] Participants were told that the purpose of Study B was to examine the effects of positive and negative training conditions on performance. It was explained that each participant would work separately on a scheduling task requiring them to organize the schedules of several busy executives. Participants were told that they and their partner would be assigned to two different conditions, such that one of them would complete the scheduling task in a positive training condition, while the other would complete the same task in a negative training condition. Participants were then informed about the details of the two training conditions.

Participants were led to believe that, regardless of condition, they would each be given a $10 base pay prior to the scheduling task. It was explained that the person who was assigned to the positive training condition would be able to earn an additional $1 for each correct response on the 10-item scheduling task with no penalty for incorrect responses, giving this person the potential to earn a total of $20. In contrast, the person in the negative training condition would lose $1 from their base pay for each incorrect

[4] The original paradigm was designed by Batson et al. (1995) to examine whether participants would violate justice or uphold justice after being induced to feel empathy for a fellow participant.

response and earn no additional money for any correct responses, giving this person the potential to earn $0.

After receiving the details about the two training conditions participants were presented with a decision, which was the main dependent variable. As a cover story for why they were being asked to make this decision, participants were told that the experimenter was not supposed to know who had been assigned to the positive and negative training conditions, so that the experimenter would not influence either person's performance. Thus, each participant was led to believe that between them and their partner, they had been randomly chosen to decide who would be assigned to which training condition. Participants were assured that their partner would not know who had made this decision—only that they had been assigned to one training condition or the other. Participants were given the option to use a computer program that would assign the conditions randomly, and were told they could assign the training conditions however they wanted.

Although it was not explicitly stated, participants had three options. First, they could assign the conditions randomly using the computer program. This option would uphold the distributive fairness norm of equality by giving both the participant and their partner an equal chance to earn more money in the positive training condition. In addition, procedural fairness would be upheld through the use of an unbiased process to arrive at the final decision. Alternatively, they could assign themselves to the positive training condition and their partner to the negative training condition. This option would violate distributive and procedural fairness norms by unilaterally giving the participant a greater chance to earn more money at the expense of their partner. Finally,

they could act altruistically by assigning their partner to the positive training condition and themselves to the negative training condition, thereby benefitting their partner at their own expense. Participants were left alone to make their decision.

After making their decision, participants completed a third and final questionnaire. This questionnaire assessed participants' state self-esteem following the assignment decision, as well as participants' perceptions about the favourability of the positive and negative training conditions (see *Measures* section). Participants were also asked to report their assignment decision and explain their reasoning behind the decision.

After completing the questionnaire, participants were told that the study was over and that they would not be completing the scheduling task. Participants were then probed for suspicion and completely debriefed concerning the true purpose of the study.

Measures

State self-esteem. The measure of state self-esteem used in Study 1 was based on Heatherton and Polivy's (1991) 20-item State Self-Esteem Scale, and included 16 items assessing social and performance-based aspects of state self-esteem that were relevant to the study context. The remaining four items from Heatherton and Polivy's (1991) scale assessed self-esteem related to physical appearance. These four items were less relevant to the study context and thus were excluded. Example items from the adapted scale are: "I am worried about whether I am regarded as a success or failure" (reverse coded), "I feel confident about my abilities," and "I feel displeased with myself" (reverse coded). All items were rated on a 7-point scale (where 1 = not at all, 7 = very much). The state self-esteem scale showed excellent reliability at each of the

three times it was administered during Study 1 (Cronbach's αs = .90 at baseline, .94 after the unfair evaluation, and .94 after the assignment decision). See Appendix C for a complete list of the state self-esteem items.

Perceptions of evaluation unfairness. Two items were used to assess whether participants perceived the experimenter's evaluation as unfair. Specifically, participants were asked to rate the extent to which the experimenter's evaluation was positive or negative (where 1 = positive, 7 = negative) and fair or unfair (1 = fair, 7 = unfair). As expected, the two items assessing participants' perceptions of the experimenter's evaluation were significantly correlated, $r(28) = .44$, $p = .01$, and were therefore averaged to create an index of perceived evaluation unfairness.

Perceptions of training conditions. To assess whether participants perceived the positive and negative training conditions as intended, participants were asked to rate the favourability of the positive training condition (where 1 = not at all favourable, 7 = very favourable) and the unfavourability of the negative training condition (1 = not at all unfavourable, 7 = very unfavourable).

Control variables. Past research suggests that gender may influence fairness toward others. Specifically, prior studies have found that females display more interactional fairness than males (e.g., Bobocel & Goreham, 2005; Gonzales, Manning, & Haugen, 1992; Gonzales, Pederson, Manning, & Wetter, 1990; Hodgins et al., 1996; Tata, 1998; Tata, 2000). Although not a primary focus of the current research, gender was therefore included as a control variable in the analyses.

Despite the prediction that a participant's independent and interdependent self-construals would influence their behaviour toward their partner following unfair

treatment from the experimenter, it is likely that a participant's perceptions of their partner's performance would also factor into their decision to act unfairly, fairly, or altruistically. For example, participants who perceive their partner as extremely competent may be more inclined to reward their partner's contribution to the decision-making task by acting fairly or altruistically toward their partner than participants who perceive that their partner contributed very little to the decision-making task. Other participants may decide that an extremely competent partner should be more able to fend for themselves in the less favourable negative training condition. Alternatively, it is possible that some participants could take pity on a less competent or less skilled partner by acting fairly or altruistically. There are, of course, many other ways that a participant's evaluation of their partner could influence the participant's reasoning. Although some of the aforementioned reasons for the assignment decision may be favoured by participants with a strong versus weak independent self-construal, or a strong versus weak interdependent self-construal, it seems likely that perceptions of a partner's performance could exert an additional influence on the assignment decision that is not attributable to the participant's self-construals. As such, participants' evaluations of their partner's performance on the decision-making task were included as a control variable in Study 1 (see also Zdaniuk & Bobocel, 2009).

Participants' evaluations of their partner's performance on the decision-making task were assessed using a 7-item partner evaluation form. Example items include: "To what extent did your partner have high quality ideas?" and "In general, to what extent do you think this person was a good partner?" All items were rated on a 7-point scale, with low ratings indicating a negative evaluation and high ratings indicating a positive

evaluation. The partner evaluation items showed good internal consistency reliability (Cronbach's $\alpha = .94$). See Appendix D for a complete list of the partner evaluation items.

Results

Perceptions of Evaluation Unfairness

An alpha level of .05 was used for all statistical tests in Study 1. The results for participants' ratings of the experimenter's evaluation revealed that participants perceived the experimenter's evaluation as only slightly unfair ($M = 4.35$, $SD = .96$, where 1 = fair and 7 = unfair). Although this rating was not as high as intended, a t-test comparing the mean unfairness rating to the scale midpoint indicated that as expected, participants rated the evaluation as more unfair than fair (midpoint = 4), $t(32) = 2.08$, $p = .05$.

Perceptions of Training Conditions

As intended, participants perceived the positive training condition to be quite favourable ($M = 6.27$, $SD = .94$, where 1 = not at all favourable, 7 = very favourable). Although reactions to the negative training condition were not as strong as expected, the negative condition was perceived as moderately unfavourable ($M = 4.64$, $SD = 2.23$, where 1 = not at all unfavourable, 7 = very unfavourable).[5] The relatively large standard deviation on this item indicated that participants were far from agreement as to the perceived unfavourability of the negative training condition. As such, this item was included as a control variable in the main analyses to control for variance due to differences in participants' perceptions of the negative training condition.

[5] Note that these two ratings were not directly comparable due to the use of two different rating scales (not at all vs. very *favourable*; not at all vs. very *unfavourable)*. As such, I could not perform a paired samples t-test to compare them. In addition, because each item assessed the *degree* of favourability and unfavourability, respectively, I could not perform a t-test to compare the respective means to their midpoints (which indicate a moderate level, rather than the absence, of each construct).

Assignment Decision

Of the 33 participants in the final sample, 13 participants acted fairly by using the computer to assign themselves and their partner to the positive and negative training conditions. An additional 12 participants acted unfairly by assigning themselves to the positive training condition and their partner to the negative training condition. Finally, 8 acted altruistically by assigning their partner to the positive training condition and themselves to the negative training condition. Because I expected individuals with a strong interdependent self-construal to act either fairly or altruistically toward their partner (Hypothesis 2), these two outcomes were combined in main regression analysis. For the purposes of the main analysis, a dummy-coded categorical outcome variable was created such that participants received a "1" if they acted unfairly, and a "0" if they acted fairly or altruistically.

Descriptive Statistics and Correlations among the Study Variables

Table 1 provides the descriptive statistics and correlations among the variables used in the Study 1 analyses. An alpha level of .05 was used in all statistical tests in Study 1. The zero-order correlations revealed no significant association between a participant's assignment decision and their (a) independent self-construal, (b) interdependent self-construal, or (c) gender. Gender was, however, consistently related to state self-esteem, such that males showed higher state self-esteem than females throughout the study, $r(28) = .30$, .43, and .46, $p = .09$, 01, and .008 (assessed at baseline, after the unfair evaluation, and after the assignment decision, respectively). In addition, participants who evaluated their partner more positively also evaluated the negative training condition (marginally) more unfavourably, $r(28) = .30$, $p = .09$. The

Table 1

Study 1: Descriptive Statistics and Correlations among Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9
1. Independent self-construal	4.40	.96	-								
2. Interdependent self-construal	5.26	.77	.11	-							
3. Assignment decision	.85	.80	.20	-.12	-						
4. Baseline state self-esteem	4.73	.90	-.03	-.08	.11	-					
5. State self-esteem after evaluation	4.39	1.13	.05	-.13	.15	.89***	-				
6. State self-esteem after decision	4.72	1.05	.08	-.19	.31†	.86***	.91***	-			
7. Gender	.45	.51	.16	-.11	.25	.30†	.43*	.46**	-		
8. Evaluation of partner	5.50	1.05	-.17	.08	.15	.12	.07	.12	.10	-	
9. Perception of negative condition	4.64	2.23	-.28	.14	.16	.07	-.03	.07	.29	.30†	-

Note. $N = 30$. Assignment decision was dummy-coded, such that unfair decisions were assigned a "1" and fair or altruistic decisions were assigned a "0." Participant gender was dummy-coded, such that males were assigned a "1" and females were assigned a "0." All other variables were measured on a 7-point scale. † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

latter correlation may reflect a tendency among participants to view the negative condition as a more unfavourable option for them when they have a partner who is very competent, and therefore might perform quite well in the negative condition. As mentioned previously, participants' evaluations of their partner and perceptions of the negative training condition were included as control variables in the main analysis.

Regression Analysis

In Hypotheses 1, I predicted that participants with a strong independent self-construal would be more likely than participants with a weak independent self-construal to act unfairly toward a group member after experiencing unfair treatment from an authority. In Hypothesis 2, I also predicted that after experiencing unfair treatment from an authority, participants with a strong interdependent self-construal would be more likely than participants with a weak interdependent self-construal to act fairly or altruistically toward a group member. To test these hypotheses, I conducted a hierarchical multiple regression analysis, the results of which are shown in Table 2.[6] The control variables of participant gender, evaluation of their partner, and perception of the unfavourability of the negative training condition were entered on Step 1 of the regression. These three variables accounted for 22% of the variance in participants' assignment decisions, which was marginally significant, $F(3, 26) = 2.37$, $p = .09$.

[6] It should be noted that although linear multiple regression is often used to examine the effects of categorical and continuous predictors on categorical outcomes (like the unfair vs. fair/altruistic criterion variable used in Studies 1 and 2), logistic regression offers an alternative procedure for analyzing categorical outcomes (Cohen, Cohen, West, & Aiken, 2003; Tabachnick & Fidell, 2007). The advantage of logistic regression is that it makes fewer assumptions about the distributions of the independent and criterion variables in the model and has less stringent requirements in general. The disadvantages are that the equations used to describe the outcome variable are more complex than in multiple regression, and interactions (such as the one examined in Study 2) are more difficult to interpret. Fortunately, in the vast majority of cases, the results of linear multiple regression and logistic regression are identical. This was also the case for the results of Studies 1 and 2; when re-examined using logistic regression, the effects reported using regular multiple regression remained unchanged in direction or significance. Therefore, for ease of exposition, the results of Studies 1 and 2 are presented using linear multiple regression.

Table 2

Study 1: Hierarchical Regression Analysis for Variables Predicting Assignment Decision

Variable	*B*	*SE B*	β	Δ R^2
Step 1				
Gender	-.41	.18	-.42*	
Evaluation of partner	.12	.08	.26	
Perception of negative condition	-.00	.04	-.02	
				.22*
Step 2				
Gender	-.58	.17	-.59**	
Evaluation of partner	.15	.07	.33††	
Perception of negative condition	.04	.04	.17	
Independent self-construal	.19	.09	.37*	
Interdependent self-construal	-.27	.10	-.42*	
				.22*

Note. $N = 30$.[7] Assignment decision was dummy-coded, such that unfair decisions were assigned a "1" and fair or altruistic decisions were assigned a "0." Participant gender was dummy-coded, such that males were assigned a "1" and females were assigned a "0." All other variables were measured on a 7-point scale.

†† $p = .05$. * $p < .05$. ** $p < .01$.

[7] Of the 33 participants in the final sample, 3 failed to complete the independent and interdependent self-construal measure. These participants were therefore excluded from the self-construal analyses.

Gender clearly accounted for the bulk of this effect on participants' assignment decisions, β = -.42, $t(26)$ = -2.31, p = .03. Counter to expectations based on prior research, male participants were more likely to act fairly or altruistically than females.

The two individual difference variables of interest, independent and interdependent self-construals, were entered on Step 2 of the regression. This step accounted for an additional 22% of the variance in participants' assignment decisions, which was significant, $F(2, 24) = 4.79$, p = .02. The results revealed that, consistent with Hypothesis 1, participants with a strong independent self-construal were more likely to act unfairly toward a group member than participants with a weak independent self-construal, β = .37, $t(24)$ = 2.18, p = .04. The results also showed support for Hypothesis 2: participants with a strong interdependent self-construal were more likely to act fairly or altruistically toward a group member than participants with a weak interdependent self-construal, β = -.42, $t(24)$ = -2.62, p = .02.

Participants' evaluations of their partners were not significant on Step 1 of the regression, β = .26, $t(26)$ = 1.45, p = .16, but became significant on Step 2 when the effects of participants' independent and interdependent self-construals were entered into the model, β = .33, $t(24)$ = 2.05, p = .05. Controlling for the effects of the two self-construals, participants who evaluated their partner more favourably were more likely to act unfairly by assigning themselves to the positive training condition and their partner to the negative training condition.

State Self-Esteem

Hypothesis 3 predicted that state self-esteem would drop following unfair treatment from the experimenter, and recover after participants acted unfairly, fairly, or

altruistically toward their partner. This hypothesis was tested using repeated measures ANOVA to examine changes in state self-esteem over time. The effect of time (the within-subjects variable) on state-self esteem was examined with independent and interdependent self-construals as between-subjects variables. For this analysis, median splits were used to categorize participants as having either a weak or strong independent self-construal (median = 4.43) and a weak or strong interdependent self-construal (median = 5.29) to allow entry of the self-construal variables into the ANOVA as categorical variables.

Overall, Hypothesis 3 was supported. The repeated measures ANOVA revealed a main effect of time on state self-esteem, $F(2, 52) = 8.95$, $p < .001$. Within-subjects contrasts revealed that this main effect was quadratic in form, $F(1, 26) = 15.22$, $p = .001$, rather than linear, $F(1, 26) = 1.37$, $p = .25$. As depicted in Figure 1, the quadratic main effect of time indicates that overall, state self-esteem dropped following unfair treatment from the experimenter but recovered after participants made their assignment decision. There was no main effect of independent self-construal, $F(1, 26) = .86$, $p = .36$, or interdependent self-construal, $F(1, 26) = .66$, $p = .42$. There was also no interaction between time and independent self-construal, $F(1, 52) = 1.16$, $p = .32$, or between time and interdependent self-construal, $F(1, 52) = .47$, $p = .63$. The non-significant interactions between time and independent self-construal, and between time and interdependent self-construal, indicated that state self-esteem recovered for all participants after making their decision, regardless of their levels of independent and interdependent self-construal.

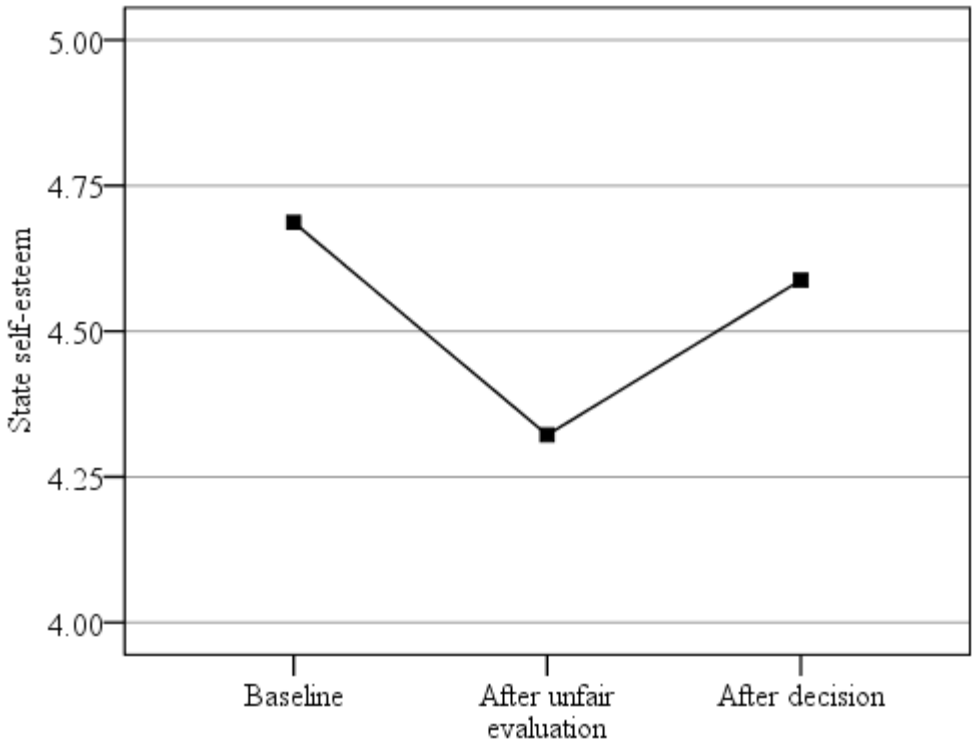

Figure 1. Effect of time on state self-esteem

Discussion

All three hypotheses were supported. As proposed in Hypothesis 1, independent self-construal predicted the likelihood of acting unfairly toward a group member following unfair treatment from an authority. Interdependent self-construal predicted the likelihood of acting fairly or altruistically toward a group member after experiencing unfair treatment from an authority, providing support for Hypothesis 2. In addition, the pattern of changes in state self-esteem over time was consistent with the notion that self-esteem is threatened by unfair treatment, but can be restored by engaging in unfair, fair, or altruistic behaviour toward a fellow group member (Hypothesis 3).

The results of Study 1 suggest that when faced with unfair treatment from an authority, individuals react differently depending on their independent and interdependent self-construals. Individuals with a strong independent self-construal give priority to personal goals and derive their self-esteem from self-expression (Markus & Kitayama, 1991; Triandis et al., 1986; Triandis et al., 1988). When faced with a threat to their self-esteem brought on by unfair treatment from an authority, these individuals may be motivated to assert the self through dominance and acts of unfairness toward innocent others. In contrast, individuals with a strong interdependent self-construal give priority to group goals and derive their self-esteem from maintaining harmonious relationships with others. When faced with self-esteem threat caused by unfair treatment from an authority, these individuals may be motivated restore their self-esteem by upholding justice norms or by engaging in actions that maintain group harmony at the expense of the self.

Study 1 was, however, not without its limitations. Most importantly, without a control condition, the possibility that unfair treatment from an authority has no impact on participants' subsequent unfairness, fairness, or altruism toward group members cannot be ruled out. In other words, individuals with a strong independent self-construal may be more likely to act unfairly toward group members regardless of how they have been treated by group authorities. Similarly, individuals with a strong interdependent self-construal may be more likely to act fairly or altruistically toward group members no matter what treatment they receive from authorities. In addition, the lack of a control condition made it impossible to directly test whether it was actually the unfair treatment from the experimenter that caused a drop in participants' state self-esteem.

A second limitation of Study 1 was the number of participants who were excluded from the data analyses due to suspicion about the true purpose of the study. Because the current study was run during the summer semester, many participants were upper-year students who had prior knowledge of deception studies, resulting in a sample that was more suspicious than usual. This increased level of suspicion had several implications. Most notably, the sample size was significantly reduced after the data of participants who expressed suspicion about the purpose of the study were excluded from the analyses. Even so, this reduced sample size did not impede the emergence of significant findings.

Related to the problem of participant suspicion, during pilot testing it was discovered that participants tended to disbelieve the experimenter's evaluation if the feedback was too negative. As a result, I tempered the experimenter's evaluation in

Study 1 to make it more believable. Unfortunately, this trade-off may have resulted in participants' perceptions of unfairness being lower than desired.

An alternative explanation for the lower-than-expected unfairness rating may be that participants were reluctant to report that the experimenter had treated them unfairly, especially when filling out a questionnaire that would be returned to the very same experimenter who had delivered the unfair treatment. Thus, social desirability bias may have influenced participants' ratings of the experimenter's evaluation.

Another limitation of Study 1 was that participants' perceptions of the negative training condition were not as negative as expected. On average, participants rated this condition as "moderately unfavourable." One reason for this moderate rating came to light during debriefing, when several participants mentioned that they assigned themselves to the negative training condition not because they believed it would be unpleasant for their partner, but because they regarded the negative training condition as a challenge and wanted to see how they would perform under pressure. Thus, for some participants the negative training condition may have been perceived more positively than intended. This issue was addressed post-hoc in Study 1 by including each participant's perception of the negative training condition as a control variable in the analyses. However, given the potential impact on the validity of the research, addressing this problem was a central concern in the design of a follow-up study.

Aside from the limitations of Study 1, the results revealed that counter to prior research, male participants were more likely to act fairly or altruistically, and hence less likely to act unfairly, compared to female participants. One explanation for this finding may be that the aforementioned tendency to perceive the negative training condition as

a challenge was more prevalent among males than females. Indeed, participants who viewed the negative training condition as a challenge and cited this (rather than concerns about being altruistic or fair) as a reason for assigning themselves to the negative condition and their partner to the positive condition tended to be male rather than female. In addition, a small number of males who had a female partner in the study stated that they chose the altruistic option out of chivalry—that is, they believed it was right for their female partner to receive the better outcome. Together, these unexpected influences may account for the counterintuitive gender finding.[8]

Despite the aforementioned limitations of Study 1, it is encouraging to note that the predicted effects were found for participants' independent and interdependent self-construals. As a result, a second laboratory study was conducted to replicate and extend the results of Study 1.

[8] Note that adding the partner's gender as a variable in the regression analyses produced no significant effects and effected no changes to the reported results. Thus, it appears that males acted more fairly or altruistically regardless of their partner's gender, suggesting their behaviour was likely based on their perception of the negative condition as a challenge, rather than chivalry toward female partners. However, due to the sample size (there were 14 male/female dyads vs. 8 male/male dyads), it is difficult to know the relative impact these two influences might have had on males' behaviour overall.

Study 2

An important goal of Study 2 was to address many of the limitations encountered in Study 1. Notably, a control condition was introduced to directly compare participants' reactions to receiving unfair vs. no unfair treatment from the experimenter. As such, I hypothesized that:

Hypothesis 4

There will be a two-way interaction between independent self-construal and unfair treatment from an authority. Specifically, participants with a strong independent self-construal will be more likely to act unfairly toward a group member after experiencing unfair treatment from an authority than participants with a weak independent self-construal; however, independent self-construal will not predict participants' behaviours toward group members in the absence of unfair treatment.

Hypothesis 5

There will be a two-way interaction between interdependent self-construal and unfair treatment from an authority. Specifically, participants with a strong interdependent self-construal will be more likely to act fairly or altruistically toward a group member after experiencing unfair treatment from an authority than participants with a weak interdependent self-construal; however, interdependent self-construal will not predict participants' behaviours toward group members in the absence of unfair treatment.

In addition to introducing a control condition, several steps were taken to reduce participant suspicion about the true purpose of the study (see the *Method* section below for more details). During debriefing, some participants in Study 1 expressed suspicion

about completing the state self-esteem questionnaire repeatedly throughout the session. Therefore, although self-esteem is believed to be a mechanism underlying the effects predicted in Hypotheses 4 and 5, the validity of this assumption was not examined in Study 2.

Method

Participants

Participants were 75 undergraduates (38 male, 37 female) at the University of Waterloo. In the original sample, 45 people participated for course credit, and 30 were paid $8 in exchange for their participation. The average age was 19 years (*SD* = 2.80). As in Study 1, participants were probed for suspicion and thoroughly debriefed at the end of each session. Based on information collected during this debriefing, the data from 9 participants was excluded from the analyses due to suspicion about critical aspects of the study. Of the 66 participants whose data was retained (31 male, 35 female), 40 participated for course credit and 26 were paid. The average age of this final sample was 19 years (*SD* = 2.94).

Procedure

Assessment of self-construals. As in Study 1, independent and interdependent self-construals were assessed during mass-testing approximately one month prior to the study using the same 20-item questionnaire adapted from Singelis (1994) and Singelis et al. (1995). Both scales showed acceptable internal consistency reliability (Cronbach's αs = .83 and .76, respectively), and in the Study 2 sample showed a marginally significant, but relatively small, positive correlation, $r(64) = .22$, $p = .08$.

Main study. A random sample of participants who completed the self-construal measures was contacted via email or phone and invited to participate a laboratory study. The procedure used in Study 2 was similar to Study 1, but with several modifications. In Study 1, participants were led to believe that they would be participating in two unrelated studies. Admittedly, this is a relatively common cover

story used in deception studies, and was cited during debriefing as a "give-away" for several of the suspicious Study 1 participants. Therefore, participants in Study 2 were told that they would be completing two separate tasks as part of a single study. As in Study 1, both experimenters were blind to participants' independent and interdependent self-construal scores.

Participants were brought into the laboratory in pairs. Prior to arriving at the laboratory, each pair of participants was randomly assigned to either the "unfair treatment condition" or the "control condition" (n = 33 for each condition in the final sample). As part of the cover story, participants were led to believe that the purpose of the study was to examine whether people perform better in a group setting versus individually. Participants were told that they would be asked to complete two tasks during the laboratory session. The first task would involve working together as a group, whereas the second task would be completed individually.

Despite the fact that participants would be working individually for the latter part of the study, steps were taken throughout the study session to enhance participants' perceptions that they were indeed members of a group. As in Study 1, the fact that participants would be working as a group on the decision-making task was repeated several times. In addition, both experimenters continued to refer to participants as "group members" and "partners" throughout the entire study.

After receiving details about the tasks they would be completing during the study, participants signed a single consent form for the entire session. After signing the consent form, participants completed the same group decision-making task as in Study 1 while being observed by the experimenter.

Following the decision-making task, the experimental manipulation of unfair treatment was introduced. As in Study 1, participants were taken to separate rooms where they would remain for the rest of the session. Participants in both conditions were asked to evaluate each other's performance, and were assured that these partner evaluations would be kept private. It was also explained to participants in both conditions that while they were evaluating each other's performance, the experimenter would prepare an individual evaluation for each of them. Participants in the unfair treatment condition were told that they would be allowed to see the experimenter's evaluation of them. However, participants in the control condition were told that the experimenter's evaluation of them would not be disclosed. After completing the evaluation of their partner's performance on the decision-making task, participants in the unfair treatment condition received the experimenter's performance evaluation, while participants in the control condition completed a filler task (see *Measures* section for more details on the experimenter's performance evaluation).

Similar to Study 1, all participants in the unfair treatment condition received the same fictitious evaluation from the experimenter. This evaluation was delivered in private, and was designed to be perceived as unfair. Recall that the evaluation used in Study 1 forced a trade-off between believability and perceptions of unfairness. Thus, extra measures were taken in Study 2 to increase both the believability and the perceived unfairness of the experimenter's evaluation.

Similar to Study 1, the experimenter's feedback in Study 2 was designed to violate principles of distributive, procedural, informational, and interpersonal fairness. Specifically, participants were only informed after the in-basket exercise was complete

that they would be receiving an individual evaluation, and no advance information about the criteria for the evaluation was provided. Participants were again led to believe that based on the short task they had just completed the experimenter had rated them quite poorly (i.e., 4/10 overall[9]). To make this negative feedback more believable, however, a reason was provided—specifically, a lack of creativity shown during the decision-making task. Though citing a specific reason for negative feedback has been shown to increase fairness perceptions (Baron, 1993), this particular explanation was designed to appear unreasonable given the explicitly *non-creative* nature of the decision-making task.

To increase the perceived unfairness of the experimenter's evaluation in Study 2, the experimenter communicated the evaluation verbally before giving participants a written copy of the evaluation. As mentioned previously, recipients of negative outcomes tend be particularly offended when they encounter disrespectful, rude, and impolite interpersonal treatment during the delivery of these outcomes (Bies & Moag, 1986; Greenberg, 1993). The experimenter's verbal evaluation was therefore designed to directly violate principles of interactional fairness through rude interpersonal treatment. Specifically, the experimenter explained in a disrespectful and dismissive tone that she hadn't expected the participant to do well anyway and that she wasn't prepared to discuss the evaluation any further. See Appendix E for a copy of the experimenter's script and Appendix F for the fictitious experimenter evaluation.

[9]Because a 10-point grading scale is more frequently used in educational settings and more easily converted to a percentage than a 7-point scale, I reasoned that undergraduates may find a rating of 4/10 (which translates to a failing grade of 40%) more impactful than a similar rating given on a 7-point scale. For this reason, all ratings on the experimenter evaluation form in Study 2 were given on a 10-point scale, rather than the 7-point scale used in Study 1.

After participants had heard the experimenter's verbal explanation and had been given a chance to look over the fictitious written evaluation (unfair treatment condition) or completed the filler task (control condition), all participants completed a questionnaire assessing their perceptions of the experimenter's treatment of them (see *Measures* section). For participants in the unfair treatment condition, this questionnaire also contained items assessing their perceptions of the experimenter's evaluation. Recall that in Study 1, participants may have been reluctant to rate the experimenter's evaluation as unfair. To reduce the possibility that these ratings would be influenced by social desirability bias, participants in Study 2 were explicitly told that this questionnaire would be private and that the experimenter would not see their responses (although it was later explained during debriefing that this was not the case).

After completing this questionnaire, participants were told that the group task was over and a second experimenter arrived to begin the individual task. As in Study 1, this second task involved choosing between a more favourable and less favourable option. However, additional steps were taken in Study 2 to ensure that the favourability of the two options was perceived as intended.

Participants were led to believe that for the individual task, they and their partner would each be reading a summary of a business meeting and answering questions about what they read. Participants were told that two different business meeting summaries were being used for this task, and that each of them would read one of the two summaries. It was explained that although the summaries were equal in difficulty, they varied in length. Summary A was said to take 5 minutes to read, while Summary B would take 15 minutes to read.

Similar to Study 1, participants were presented with a decision as the main dependent variable. Participants were told that the experimenter was not supposed to know who would be reading the short and the long summary (again so as not to influence either person's performance). Therefore, each participant was told that between them and their partner, they had been randomly chosen to decide who would read which summary. It was explained that their partner would not be aware that such a decision had been made—only that they would be reading a 5-minute or a 15-minute summary. Participants were again given the option to use a computer program that would assign the conditions randomly, but were told they could assign the summaries however they wanted. In addition, participants were informed that since they were the one making the decision, they could take the shorter summary for themselves and leave early when they were finished. It was hoped that the prospect of leaving the study early would appeal equally to most participants.

Participants were handed sealed envelopes labelled "A" and "B." It was clearly indicated that envelope "A" contained the shorter summary, and envelope "B" contained the longer summary. After making their decision, participants were asked to write their name on the envelope of the summary they wished to keep for themselves, and give their partner's summary to the experimenter upon the experimenter's return. It was explained that the experimenter would deliver this summary to their partner. To increase participants' privacy, the "A" and "B" labels were printed on post-it notes, and participants were asked to remove these after writing their name on the envelope they wished to keep. After receiving these instructions, participants were left alone for several minutes to make their decision.

As in Study 1, it was obvious that participants had three options. First, participants could choose to uphold principles of distributive and procedural fairness by assigning the summaries using the random method. Alternatively, they could act unfairly by keeping the shorter summary for themselves and giving the longer summary to their partner. Finally, they could act altruistically by giving their partner the shorter summary and keeping the longer summary for themselves.

After assigning the two summaries according to the method of their choice and handing back their partner's summary to the experimenter, participants completed a questionnaire assessing how favourable they thought it would be to read the shorter and longer business meeting summaries, respectively. This questionnaire also asked participants to report their assignment decision and explain their reasoning.

Upon completing the questionnaire, participants were told that the study was over and that they would not actually be reading a business meeting summary. Finally, participants were probed for suspicion and completely debriefed concerning the true purpose of the study.

Measures

Perceptions of experimenter treatment. All participants responded to three items assessing their perceptions of the first experimenter's treatment of them during the group task. Specifically, participants were asked to indicate the extent to which the experimenter had treated them sensitively or insensitively (where 1 = sensitive, 7 = insensitive), respectfully or disrespectfully (1 = respectfully, 7 = disrespectfully), and fairly or unfairly (1 = fairly, 7 = unfairly). These three items showed excellent internal

consistency reliability (Cronbach's α = .90) and were therefore combined into an experimenter treatment scale.

Perceptions of evaluation unfairness. Participants in the unfair treatment condition responded to three items assessing whether they perceived the experimenter's evaluation as unfair. Similar to Study 1, these items asked participants to rate the extent to which the experimenter's evaluation was positive or negative (where 1 = positive, 7 = negative), accurate or inaccurate (1 = accurate, 7 = inaccurate), and fair or unfair (1 = fair, 7 = unfair). These three items showed good internal consistency reliability (Cronbach's α = .76), and were averaged to create a measure of perceived evaluation unfairness. Participants in the control condition did not receive an evaluation from the experimenter and therefore did not respond to items assessing their perceptions of the experimenter's evaluation.

Control Variables

As in Study 1, gender and evaluation of partner were included as control variables in the Study 2 analyses.

The partner evaluation form was modified slightly in Study 2 to maintain consistency with the experimenter's evaluation by including an item assessing the partner's creativity. In addition, a 10-point rating scale was used to maintain consistency with the fictitious experimenter evaluation, which also used a 10-point rating scale in Study 2. The items on the revised partner evaluation form showed excellent internal consistency reliability (Cronbach's α = .94). See Appendix G for a complete list of the partner evaluation items used in Study 2.

Results

Perceptions of Experimenter Treatment

An alpha level of .05 was used for all statistical tests in Study 2. As expected, a one-way ANOVA revealed that participants in the unfair treatment condition perceived that the experimenter had treated them more unfairly ($M = 3.80$, $SD = 1.35$) than participants in the control condition ($M = 1.54$, $SD = 0.63$), $F(1, 58) = 63.34$, $p = .000$.

Perceptions of Evaluation Unfairness

Because participants in the control condition did not receive an evaluation from the experimenter, the unfairness perceptions of participants in the unfair treatment condition could not be compared to a control condition. Instead, a t-test was conducted to examine how the mean unfairness perceptions of participants in the unfair treatment condition ($M = 4.79$, $SD = 1.20$) compared to the scale midpoint (recall that this scale ranged from 1 = fair to 7 = unfair, with an unlabeled midpoint of 4). As expected, the results revealed that the mean was significantly above the scale midpoint, indicating that participants in the unfair treatment condition perceived the evaluation as relatively more unfair than fair, $t(32) = 3.79$, $p = .001$.

Perceptions of Business Meeting Summaries

Participants were also asked to indicate how favourably they perceived the task of reading the shorter and longer business meeting summaries. A paired samples t-test showed that, as hoped, participants perceived the task of reading the shorter business meeting summary to be more favourable ($M = 4.85$, $SD = 1.68$) than the task of reading the longer business meeting summary ($M = 3.41$, $SD = 1.63$), $t(65) = 4.54$, $p = .000$.

Assignment Decision

Of the 66 participants in the final sample, 31 acted fairly by using the computer to assign the business meeting summaries. A total of 18 participants acted unfairly by keeping the shorter summary for themselves and giving their partner the longer summary. Another 17 acted altruistically by giving their partner the shorter summary and keeping the longer summary for themselves. As in Study 1, I combined the fair and altruistic outcomes, creating a dummy-coded categorical outcome variable such that participants received a "1" if they acted unfairly, and a "0" if they acted fairly or altruistically.

Descriptive Statistics and Correlations among the Study Variables

Table 3 gives the descriptive statistics and correlations among the variables included in the main Study 2 analyses. As can be seen in Table 3, despite random assignment of participants to the unfair and control conditions, there was a significant relation between gender and condition, $r(64) = -.27$, $p = .03$. Specifically, there were more females (22) than males (11) in the unfair treatment condition, and more males (20) than females (13) in the control condition. There was also a significant positive zero-order correlation between independent self-construal and participants' assignment decisions, $r(64) = .32$, $p = .01$, suggesting that, overall, participants with a strong independent self-construal were more likely to act unfairly by keeping the shorter summary for themselves and giving their partner the longer summary than participants with a weak independent self-construal. The zero-order correlations showed no relation between interdependent self-construal and assignment decision, or between condition

Table 3

Study 2: Descriptive Statistics and Correlations among Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6
1. Independent self-construal	4.12	1.21	-					
2. Interdependent self-construal	5.07	.72	.22†	-				
3. Condition	.50	.50	.19	.11	-			
4. Assignment decision	.27	.45	.32*	-.01	.00	-		
5. Gender	.47	.50	.14	.11	-.27*	.04	-	
6. Evaluation of partner	7.03	1.78	.10	.17	-.07	-.06	-.07	-

Note. $N = 66$. Condition was dummy-coded, such that participants in the unfair treatment condition were assigned a "1" and participants in the control condition were assigned a "0." Assignment decision was dummy-coded, such that unfair decisions were assigned a "1" and fair or altruistic decisions were assigned a "0." Participant gender was dummy-coded, such that males were assigned a "1" and females were assigned a "0." All other variables were measured on a 7-point scale.

† $p < .10$. * $p < .05$.

and assignment decision. The main and interactive effects of these variables were further probed using hierarchical multiple regression.

Regression Analyses

A series of hierarchical multiple regression analyses were conducted to test Hypotheses 4 and 5. In the first analysis, the full theoretical model was tested. The control variables of gender and evaluation of partner were entered on Step 1 of the regression, and the main effects of independent self-construal, interdependent self-construal, and condition were entered on Step 2. The interaction between independent self-construal and condition, and the interaction between interdependent self-construal and condition, were entered on Step 3. The results of the full theoretical model revealed a significant main effect of independent self-construal on Step 2 (B = .13, SE = .05), $t(60) = 2.77$, p = .007, and a marginally significant interaction between independent self-construal and condition on Step 3 (B = .17, SE = .10), $t(58) = 1.79$, p = .08. There was, however, no main effect or interaction involving interdependent self-construal. There was also no main effect of gender. As such, interdependent self-construal and gender were trimmed from the model. Although not significant, the coefficient for evaluation of partner was stronger than the coefficients for interdependent self-construal and gender, and was thus retained as a control variable to maintain consistency with Study 1.[10,11]

[10] Because gender was correlated with condition, a model including gender in addition to evaluation of partner as control variables was examined. The results were virtually identical to those for the revised model excluding gender. A small change in the significance of the interaction between independent self-construal and condition was observed, such that the p-value of .054 (p = .05) in the revised model changed to a p-value of .057 (p = .06) when gender was included. The magnitude of this change was small enough to suggest that gender had no meaningful impact on the Study 2 results, and that the difference may have been caused by the extra degree of freedom gained by excluding gender from the analyses.

The results of the revised model are displayed in Table 4. Evaluation of partner was entered as a control variable on Step 1 (B = -.02, SE = .03), $t(64)$ = -.49, p = .62, but alone it accounted for none of the variance in assignment decision, $F(1, 64)$ = .24, p = .62. The main effects of condition and independent self-construal were entered on Step 2, which accounted for 11% of the variance in assignment decision, F (2, 62) = 3.82, p = .03. These results revealed a main effect of independent self-construal, which indicated that, overall, participants with a strong independent self-construal were more likely to act unfairly toward a group member than participants with a weak independent self-construal (B = .13, SE = .05), $t(62)$ = 2.76, p = .008. There was no main effect of condition (B = -.06, SE = .11), $t(62)$ = -.58, p = .56.

The addition of the interaction between independent self-construal and condition on Step 3 of the regression accounted for an additional 5.3% of the variance in participant assignment decision, which was significant $F(1, 61)$ = 3.87, p = .05. The interaction between independent self-construal and condition was also significant (B = .18, SE = .09), $t(61)$ = 1.97, p = .05. The presence of this interaction indicated that the slope of independent self-construal was different in the unfair and control conditions. With the addition of the interaction between independent self-construal and condition to the model, the main effect of independent self-construal became non-significant, indicating that the main effect was qualified by the interaction.

A plot of the interaction is shown in Figure 2.[12] A simple slopes analysis was conducted to examine the slopes in both conditions. As predicted in Hypothesis 4, there

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[11] As in Study 1, including partner gender in the Study 2 analyses revealed no significant effects or impact on the reported results.

[12] Possible values for the criterion variable were 0 or 1. Thus, the negative value displayed in Figure 2 is an artefact of the graphing technique, which plots predicted values of the criterion variable at one

Table 4

Study 2: Hierarchical Regression Analysis for Variables Predicting Assignment Decision

Variable	*B*	*SE B*	ΔR^2
Step 1			
Evaluation of partner	-.02	.03	
Step 2			
Evaluation of partner	-.02	.03	
Independent self-construal	.13**	.05	
Condition	-.06	.11	
			.11*
Step 3			
Evaluation of partner	-.04	.03	
Independent self-construal	.04	.06	
Condition	-.07	.11	
Independent SC x condition	.18††	.09	
			.05††

Note. $N = 66$. Condition: unfair treatment = 1, control = 0. Assignment decision: unfair = 1, fair/altruistic = 0.

†† $p = .05$. * $p < .05$. ** $p < .01$.

standard deviation below and above the mean on the continuous predictor variable (independent self-construal) (see Aiken & West, 1991).

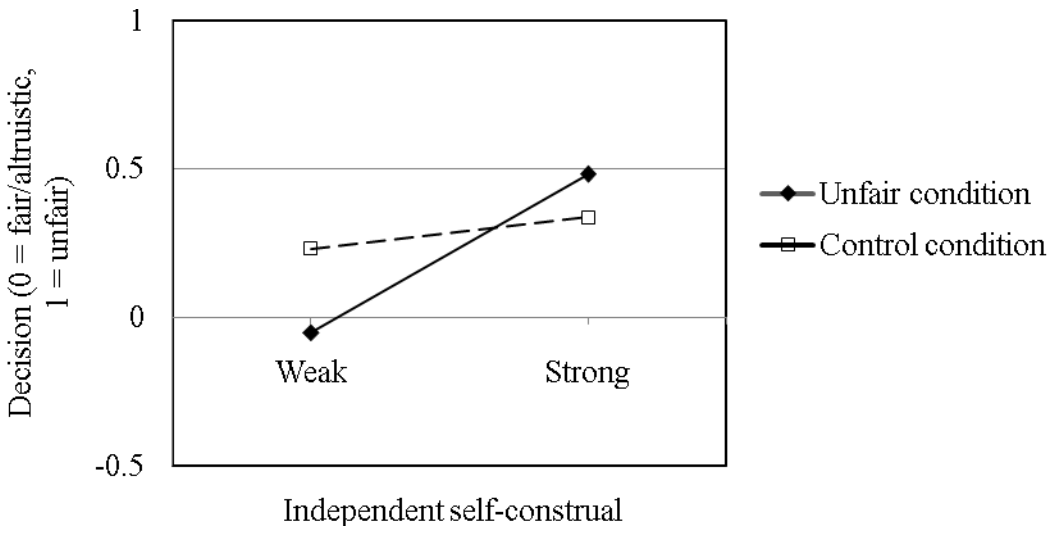

Figure 2. Interaction of independent self-construal and condition predicting assignment decision

was a significant positive relation between independent self-construal and assignment decision in the unfair treatment condition, $B = .22$, $SE = .06$, $t(62) = 3.38$, $p = .001$, but not in the control condition, $B = .04$, $SE = .07$, $t(62) = .67$, $p = .50$.

Discussion

Overall, the results for independent self-construal replicated and extended the findings from Study 1. As predicted in Hypothesis 4, there was a significant interaction between independent self-construal and condition. A simple slopes analysis revealed that participants with a strong independent self-construal were more likely to act unfairly toward their partner than participants with a weak independent self-construal after experiencing unfair treatment from the experimenter. In the absence of unfair treatment from the experimenter, however, independent self-construal no longer predicted participants' behaviour. Taken together, the findings of Studies 1 and 2 are consistent with the notion that when individuals with a strong independent self-construal experience unfair treatment from an authority, they may be more motivated to restore their threatened self-esteem by acting unfairly toward an innocent other than individuals with a weak independent self-construal. These findings further suggest that in the absence of unfair treatment from an authority, individuals with a strong independent self-construal are no more likely than those with a weak independent self-construal to act unfairly toward an innocent group member.

Although the results for independent self-construal were consistent with Hypothesis 4, I had expected the interaction between independent self-construal and condition to be driven by an increased tendency among participants with a strong independent self-construal in the unfair treatment condition to behave unfairly, as compared to the control condition. This effect was present, but was accompanied by a tendency among individuals with a weak independent self-construal in the unfair treatment condition to behave fairly or altruistically, as compared to the control

condition. Although unexpected, this result does not actually run counter to theory. Recall that individuals with a weak independent self-construal lack the competitive streak that characterizes individuals with a strong independent self-construal. Beyond this, very little is known about the motivations and goals of individuals with a weak independent self-construal. Assuming that there is no other known motivation associated with a weak independent self-construal, it is possible that under conditions of self-esteem threat, these individuals may attempt to restore their self-esteem by following a universal behavioural norm, such as fairness. Unfortunately, this hypothesis cannot be tested, as participants' perceptions of fairness norms were not assessed in Study 2.

In contrast to the promising findings for independent self-construal, the results for interdependent self-construal failed to replicate the findings from Study 1. Specifically, there was no relation between participants' interdependent self-construal and their likelihood of acting fairly or altruistically toward their partner. In addition, there was no evidence supporting an interaction between interdependent self-construal and condition. Thus, Hypothesis 5 was not supported. It appears that in the context of Study 2, individuals with a strong interdependent self-construal were no more likely than those with a weak interdependent self-construal to act fairly or altruistically toward their partner. This lack of a relation between interdependent self-construal and participant behaviour was not influenced by the presence or absence of unfair treatment from an authority.

The reason for the discrepancy between the results of Study 1 and Study 2 concerning the effect of interdependent self-construal on participant behaviour remains

unclear. However, it should be noted that the dependent variables for the two studies were quite different. Participants in Study 1 were presented with a decision that would impact the amount of money they could earn, whereas participants in Study 2 were presented with a decision that would influence the amount of time it would take to complete the experimental session. These two decisions may have been viewed quite similarly by individuals with a strong vertical independent self-construal, whose competitive nature may drive them to assert their dominance over others regardless of the situation. In contrast, it is possible that tangible resources, such as money, are a stronger prime for fairness concerns among individuals with a strong interdependent self-construal than non-tangible resources, such as time. Although the lack of findings for interdependent self-construal in Study 2 could be related to the nature of the dependent variable, additional research is needed to boost confidence in the Study 1 findings concerning interdependent self-construal.

Study 2 was designed to address several limitations of Study 1; however, both studies were conducted in a laboratory setting. As such, a third study was conducted to replicate the results of Studies 1 and 2 in the field.

Study 3

The primary purpose of Study 3 was to examine the interactive effects of independent and interdependent self-construals and unfair treatment from authorities on unfair and fair behaviour toward group members in a field sample. The sample chosen for Study 3 consisted of pairs of graduate students working under the same faculty supervisor who filled out a daily survey at the end of their school day every weekday for two weeks. Although this was not a traditional working sample, most full-time graduate students in thesis-based programs conduct research under the direct supervision of their faculty supervisor, devote full-time hours to their research and coursework for an extended period of time (typically ranging from 2 years for a master's to 5 years or more for a PhD), and are often paid for their work. As such, there is no obvious reason to believe that a typical graduate student's interactions with their supervisor are very different from other employee-manager interactions. In addition, graduate students often share offices with one another and collaborate with their fellow students on coursework and research projects. Thus, graduate students' interactions with their colleagues may be quite similar to the interactions among co-workers in a traditional workplace.

As in Study 2, I hypothesized that:

Hypothesis 6

There will be a two-way interaction between independent self-construal and unfair treatment from a supervisor, such that students will be more likely to act unfairly toward a fellow graduate student on days when they feel more unfairly treated by their supervisor if they have a strong, as compared to weak, independent self-construal.

Hypothesis 7

There will be a two-way interaction between interdependent self-construal and unfair treatment from a supervisor, such that students will be more likely to act fairly toward a fellow graduate student on days when they feel more unfairly treated by their supervisor if they have a strong, as compared to weak, interdependent self-construal.

The results of Study 1 were consistent with the assumption that self-esteem may be a mechanism underlying the effects of participants' independent and interdependent self-construals on unfair and fair treatment of an innocent other. Self-esteem was not examined in Study 2; therefore, a secondary purpose of Study 3 was to re-examine the effects of unfair treatment from authorities on participants' self-esteem.

Recall that in Study 1, an adapted version of Heatherton and Polivy's (1991) State Self-Esteem Scale was used to measure social and performance-based aspects of self-esteem that were relevant to the laboratory tasks that participants were asked to perform. I decided that, because Study 3 was to be conducted in a field setting, a context-specific measure of self-esteem would be most appropriate. Given the aforementioned parallels between graduate school and a traditional workplace environment, a measure of organization-based self-esteem was adapted for use in the current study.

Organization-based self-esteem is defined as "the degree to which organizational members believe that they can satisfy their needs by participating in roles within the context of an organization," and is said to reflect "the self-perceived value that individuals have of themselves as organization members" (Pierce, Gardner, Cummings, & Dunham, 1989, p. 625). In much the same way that traditional

employees see themselves as organizational members, graduate students may also see themselves as members of their graduate program, leading them to base their self-perceived value on their roles within the program. According to Pierce et al. (1989), organization-based self-esteem is a better predictor of organization-related behaviours and attitudes than global or task-specific self-esteem. This suggests that assessing "program-based self-esteem" may be the best way to examine the impact of supervisor unfairness on graduate students' self-esteem. Furthermore, organization-based self-esteem has been used in studies examining the impact of unfairness on managers' self-esteem and subsequent treatment of subordinates (e.g., Wiesenfeld et al., 2000). Therefore, although not directly examined as a mediator in the current research, "program-based self-esteem" may be a mechanism underlying the effects of independent and interdependent self-construals on students' program-related behaviours, such as unfairness and fairness toward fellow graduate students.

Just as global and task-specific self-esteem show temporary fluctuations following positive and negative events (Greenier et al., 1999; Heatherton & Polivy, 1991; Kernis, Cornell, Sun, Berry, & Harlow, 1993), organization-based self-esteem has also been shown to fluctuate based on daily events in the workplace (Ferris, Spence, Heller, & Brown, 2009). Therefore, I predicted that:

Hypothesis 8

Controlling for baseline program-based self-esteem, graduate students will report lower program-based self-esteem on days when they experience unfair treatment from their supervisor than on days when they experience less unfair treatment from their supervisor.

Although individual differences in independent and interdependent self-construals may combine with the situational factor of supervisor unfairness to predict behaviour toward fellow graduate students, it is likely that environmental factors also influence graduate students' treatment of their colleagues. One such factor may be graduate students' perceptions about the "fairness environment" within their graduate program. Justice climate is a term that describes a group-level cognition held by employees within a workgroup or organization about how fairly employees within that workgroup or organization are treated (Naumann & Bennett, 2000). As a group-level variable based on aggregate scores, justice climate may be best used to predict group-level outcomes (Robinson, 1950; Sackett & Larson, 1990). However, it follows that an individual-level version of this construct, reflecting individual graduate students' beliefs about how fairly people treat each other in their graduate program, may be used to predict individual behaviour.

It seems plausible that graduate students who perceive a weak fairness environment in their graduate program (in which faculty supervisors and graduate students do not treat each other very fairly) may come to value fairness less than those who perceive a strong fairness environment (in which faculty supervisors and graduate students do treat each other fairly). As a result, graduate students who perceive a weak fairness environment may become less inhibited about treating colleagues unfairly when it suits their purposes.[13] In contrast, graduate students who perceive a strong

[13] While it may seem logical to predict that perceptions of a strong *unfairness* environment (rather than a weak *fairness* environment, as proposed here) should increase the likelihood that students will treat their colleagues unfairly, it should be noted that graduate programs with a strong unfairness environment may be uncommon. That is, although students may report a great deal of variability in unfair behaviour by individual supervisors, it seemed less likely that they would report a strong environment of unfairness as being characteristic of the program as a whole. As such, the fairness environment scale (strong versus

fairness environment may accept fairness as the norm and come to value fairness highly, making them more likely to treat colleagues fairly than students who perceive less fairness in their program.

Although these potential main effects of fairness environment may be interesting, the interactive effects of fairness environment with participants' independent and interdependent self-construals, respectively, are of greater interest in Study 3. I predict that graduate students' perceptions of the fairness environment will exaggerate pre-existing tendencies stemming from a strong independent or interdependent self-construal. Therefore, I propose that graduate students' perceptions of the fairness environment in their graduate program will moderate the two-way self-construal by supervisor treatment interactions outlined in Hypotheses 6 and 7. Specifically:

Hypothesis 9

There will be a three-way interaction of independent self-construal, perceptions of the fairness environment, and supervisor treatment on students' unfairness toward fellow graduate students. Graduate students with a strong, as opposed to weak, independent self-construal will be most likely to behave unfairly toward a fellow graduate student on days when they have been treated more unfairly by their supervisor if they perceive a weak, rather than strong, fairness environment in their graduate program.

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weak) was deemed a more suitable measure and was expected to show more variability than an unfairness environment scale might.

Hypothesis 10

There will be a three-way interaction of interdependent self-construal, perceptions of the fairness environment, and supervisor treatment on students' fairness toward fellow graduate students. Graduate students with a strong, as opposed to weak, interdependent self-construal will be most likely to behave fairly toward a fellow graduate student on days when they have been treated more unfairly by their supervisor if they perceive a strong, rather than weak, fairness environment in their graduate program.

Method

Participants

Participants were 60 pairs of graduate students from 5 universities in Southwestern Ontario (9 from Queen's University, 18 from the University of Guelph, 18 from the University of Waterloo, 13 from the University of Western Ontario, and 2 from Wilfrid Laurier University).[14] An effort was made to recruit pairs of participants from across all faculties and departments at each university, which resulted in a sample of graduate students from a diverse range of academic backgrounds. Participants were paid according to the number of surveys they completed (see *Procedure* for details).

To participate in Study 3, pairs of graduate students were required to meet several eligibility requirements. Some of these eligibility requirements were related to the differing roles assigned to the two members of each pair—hereafter referred to as Student 1 and Student 2. Although both Student 1 and Student 2 were blind to the research hypotheses until the end of the study, the role of Student 1 was to report how they (Student 1) were treated daily by their supervisor, while the role of Student 2 was to report how Student 1 behaved toward them (Student 2) daily.[15]

The first eligibility requirement applied to both Student 1 and Student 2, and stipulated that both members of each pair should be in the same graduate program and

[14] It is impossible to calculate a response rate for Study 3, given that many graduate students would not have met the numerous eligibility requirements outlined in the advertisement and information letters (see *Participants* and *Procedure* sections for more details). Based on the graduate enrolment figures available for the five universities listed, the pool of potential participants (eligibility requirements notwithstanding) was approximately 13,500.

[15] Given that Student 2 was asked to answer questions about Student 1's behaviour, it may have been natural for Student 2 to assume that Student 1 was also answering questions about their own behaviour toward Student 1. To avoid any suspicions and unnatural interactions this might cause, Student 2 was explicitly told that Student 1 was being asked to answer a different set of questions about their supervisor, and would under no circumstances be answering questions about Student 2.

have the same faculty supervisor.[16] This requirement was necessary because faculty supervisors exert an enormous influence on the experiences and expectations of their graduate students. As such, allowing students with different supervisors to participate as a pair may have introduced a number of confounding factors into Student 2's reports on Student 1's behaviour. Given that the current research focuses on unfair behaviour enacted toward fellow group members following unfair treatment from an authority, this requirement also helped to ensure that Student 1 and Student 2 perceived themselves to be members of the same "group"—that is, the same graduate program and research laboratory.

The second requirement stated that Student 1 should typically interact (face-to-face, or via phone or email) with their faculty supervisor at least once a week. This requirement was intended to increase the chances that Student 1 would have several supervisor interactions to report on during the 2-week daily survey period. Similarly, the third requirement stipulated that Student 1 and Student 2 should typically interact with each other at school on a daily or almost daily basis, giving Student 2 the chance to report on Student 1's behaviour.

The final eligibility requirement stated that Student 1 should be in their first year of study (master's or PhD) with their current faculty supervisor. No such restrictions were placed on Student 2, who could be in any year of study with their current supervisor. There were a number of reasons for this requirement. Over the several years it may take to complete a master's, PhD, or both, graduate students who encounter regular unfair treatment from their supervisor may learn certain coping

[16] Note that this first requirement (and the entire design of Study 3) implicitly excluded students from graduate programs where students have no faculty supervisor (i.e., MBA students), as well as those who are their supervisor's only graduate student.

strategies, such as avoiding their supervisor, switching to another supervisor, or quitting the program altogether. Students in their first year with a new supervisor may have had less time to implement these avoidant strategies. Senior students may also rely less on their supervisor as they become more familiar with their research, requiring fewer interactions with their supervisor than junior students. In addition, the first year of supervision may be the most difficult for both the student and the supervisor, as each party must adapt to a new working relationship. For all of these reasons, I reasoned that requiring Student 1 to be in their first year of study with their current supervisor would increase the variability in supervisor unfairness observed in Study 3.

The 60 pairs of participants who expressed interest in the study and met each of the aforementioned eligibility requirements were invited to complete a one-time pre-study survey, followed by a series of 10 daily surveys over a two week period (see *Procedure* for details). After completing the pre-study survey, 2 participants (from different pairs) failed to complete any daily surveys. These 2 pairs were therefore removed from the dataset, leaving 58 pairs of participants in the final sample.

Of the 58 participants in the Student 1 role, 27 were male and 31 were female. The average age for Student 1 was 25 years (SD = 3.01). At the time of the study, the majority of participants in the Student 1 role were pursuing a master's degree (81%), and the rest were working toward a PhD (19%). Of the 58 participants in the Student 2 role, 18 were male and 40 were female. Reflecting the lack of restrictions on Student 2's year of study with their current supervisor, participants in the Student 2 role were slightly older (M = 27 years, SD = 5.13) and more likely to be enrolled in a PhD program (66% master's, 34% PhD) than participants in the Student 1 role.

In appreciation for their participation, all participants received $1 for each of the daily surveys they completed. Participants who completed all 10 daily surveys also had their name entered in one of two draws for $500 (one draw for Student 1 and another for Student 2).

Procedure

Participants were recruited through advertisements in graduate studies newsletters and email advertisements sent directly to graduate students by graduate studies co-ordinators and department administrative assistants at the 5 universities involved in the study. These advertisements invited graduate students to participate in a study examining organizational culture in graduate school programs, and gave a brief description of the study design, eligibility requirements, and compensation. The advertisement contained an online link to an information letter, which provided additional details.

The information letter explained that the study would be conducted in pairs, such that participants would be asked to nominate a fellow graduate student who met the study's eligibility requirements (as described in the *Participants* section) to participate with them.[17] The information letter went on to explain that both members of each pair (i.e., Student 1 and Student 2) would be asked to complete a series of online surveys. The first survey would be a one-time pre-study survey, followed by a series of 10 daily surveys. These daily surveys were to be completed at the end of each school day (Monday to Friday) for a 2-week period, and would ask participants about their

[17]The information letter instructed participants to decide on their own, based on the eligibility requirements, which member of their pair would be Student 1 and Student 2. When both members of the pair met the eligibility requirements for Student 1, it appeared that the person who initially expressed interest in participating usually took the role of Student 1, and the person who was nominated took the role of Student 2.

daily experiences in their graduate program. To encourage participants to complete the surveys at the end of the day (thereby increasing the number of interactions they would be able to report on), participants were told the daily surveys would be available between 2 p.m. and 10 p.m. Finally, Student 1 and Student 2 were asked to agree to refrain from discussing the study or their responses on any of the surveys with anyone (including each other, fellow graduate students, or their faculty supervisor) until the study was over. It was explained that doing so may bias the results of the study.

Both members of each pair were asked to email the researcher to confirm that they had read the information letter in its entirety, met all of the eligibility requirements, and agreed to participate. After confirming these details, Student 1 and Student 2 completed their respective pre-study surveys. The Student 1 pre-study survey consisted of questionnaires assessing Student 1's independent and interdependent self-construals, baseline program-based self-esteem, perceptions of the fairness environment in their graduate program, general attitude toward Student 2, and demographic information. The Student 2 pre-study survey consisted of a questionnaire assessing Student 2's general attitude toward Student 1, as well as demographic information.

One week after completing the Student 1 and Student 2 pre-study surveys, Student 1 and Student 2 began completing their respective daily surveys, which remained the same for all 10 days. The Student 1 daily survey consisted of questionnaires assessing Student 1's daily contact with their faculty supervisor, the faculty supervisor's daily unfairness toward Student 1, and Student 1's daily program-based self-esteem. The Student 2 daily survey consisted of a questionnaire assessing Student 2's daily contact with Student 1, as well as Student 1's daily behaviour toward

Student 2. For a summary of which measures were included in the Student 1 and 2 pre-study and daily surveys, see Appendix H.

Throughout the 2-week daily survey period, it was not uncommon for one or both members of a pair to miss several daily surveys. Because Student 1 was providing data for the daily predictor variable (supervisor treatment) and Student 2 was providing data for the daily criterion variable (Student 1's behaviour), it was necessary for both Student 1 and Student 2 to fill out their daily surveys on the same days for the dataset to be complete. As a result, both members of each pair of participants were given the opportunity to "make up" surveys that either they or the other member of their pair had missed by completing up to five extra daily surveys. In keeping with the established compensation schedule, participants continued to receive $1 for each extra survey they completed. These extra surveys also counted toward participants' total numbers of surveys completed, such that participants who completed any 10 surveys over the revised 3-week study period were entered in one of the two $500 draws.

Measures

Independent and interdependent self-construals. Student 1's independent and interdependent self-construals were assessed during the pre-study survey using the same 20-item questionnaire adapted from Singelis (1994) and Singelis et al. (1995) used in Studies 1 and 2. To maintain consistency with the rest of the measures in the Student 1 pre-study survey, the instructions were adapted slightly for use in the context of a graduate program. See Appendix A for the revised instructions. Although the independent self-construal subscale showed good internal consistency reliability (Cronbach's $\alpha = .78$), the reliability of the interdependent self-construal subscale was at

the lower end of the acceptable range (α = .63). Unfortunately, this reliability could not be improved by removing any items; therefore, the interdependent self-construal subscale was left intact. As in Study 2, independent and interdependent self-construals showed a marginally significant, but relatively small, positive correlation, $r(56) = .24$, $p = .07$.

Fairness environment. Student 1's perceptions of the fairness environment in their graduate program were measured in the pre-study survey using a 24-item scale adapted from Colquitt's (2001) 20-item organizational justice measure. Like Colquitt's (2001) measure, the fairness environment scale assessed aspects of distributive, procedural, interpersonal, and informational justice. Each item in the fairness environment scale was based on one of Colquitt's (2001) items; however, the new items were rephrased to assess general fairness perceptions rather than fairness perceptions concerning a specific outcome, as in the original scale. For example, the original item "Does your outcome reflect the effort you have put into your work" was changed to "The outcomes that grad students receive reflect the effort they put into their work." When necessary, items were further reworded to ensure clarity and relevance to a graduate program context. For example, the original item "Have you been able to express your views and feelings during those procedures" was changed to "Grad students are able to express their views about decisions that affect them." Two items that seemed awkward when rephrased and had little relevance to the graduate program context were not included in the new scale ["Have you been able to appeal the (outcome) arrived at by these procedures?" and "Has (he/she) seemed to tailor (his/her) communications to individuals' specific needs"].

Rather than stating the target of the items in the instructions as Colquitt (2001) did (i.e., "The following items refer to the authority figure who enacted the procedure"), specific targets were added to many of the original items. For example, the two fairness environment items "Faculty supervisors treat grad students in a polite manner" and "Grad students treat each other in a polite manner" are both based on Colquitt's (2001) item "Has (he/she) treated you in a polite manner?"

In addition, two items were added to assess participants' global perceptions of the fairness environment: "Overall, I believe my grad program is fair" and "Overall, people treat each other fairly in my grad program."

Participants were asked to rate the extent to which each of the 24 items in the fairness environment scale described their graduate program on a 7-point scale (where 1 = strongly disagree, 7 = strongly agree), such that higher scores reflect a general perception that the graduate program is fair. Despite the fact that the fairness environment scale assessed all four facets of fairness, as well as global perceptions of fairness, the scale showed excellent internal consistency reliability (Cronbach's α = .92). Given the focus of the current research on assessing all aspects of fairness, these 24 items were averaged to create a general measure of the fairness environment. See Appendix I for a list of all of the fairness environment items.

Supervisor treatment. Student 1's daily perceptions of their faculty supervisor's treatment of them were assessed using an 8-item measure. This measure was developed for Study 3, and was designed to assess fair versus unfair treatment as a global construct, tapping aspects of distributive, procedural, interpersonal, and informational justice. Example items are: "fairly vs. unfairly", "unbiased vs. biased", and "sensitive

vs. insensitive." Participants were asked to rate each item on a 7-point scale, with lower scores reflecting fair treatment and higher scores reflecting unfair treatment. The daily supervisor treatment scale showed excellent internal consistency reliability across all 10 daily surveys (Cronbach's αs ranging from .94 to .99, average α = .97). See Appendix J for the instructions and a full list of the daily supervisor treatment items.

An exploratory qualitative measure of unfair supervisor treatment was also included in the daily surveys. Specifically, at the end of each daily survey, Student 1 was given the opportunity to provide a written description of any unfair treatment they received from their supervisor that day. See Appendix J for these instructions.

Program-based self-esteem. Student 1's program-based self-esteem was assessed using Van Dyne and Pierce's (2004) 5-item measure, which is a short version of Pierce et al.'s (1989) 10-item organization-based self-esteem scale. General instructions were used to assess baseline program-based self-esteem in the pre-study survey, whereas daily instructions were used to assess daily program-based self-esteem in the daily surveys. Example items are: "I count around here" and "I am taken seriously around here." Participants were asked to rate each item on a 7-point scale (where 1 = strongly disagree, 7 = strongly agree). Baseline program-based self-esteem showed excellent internal consistency reliability in the pre-study survey (Cronbach's α = .86) and in the daily surveys (Cronbach's αs ranging from .91 to .98, average α = .95). See Appendix K for the general and daily instructions and a full list of program-based self-esteem items.

Criterion variables. Student 2's daily perceptions of Student 1's behaviour were assessed using two different measures. The first measure was a rating scale comprising

the same 8 items used to assess daily supervisor treatment. This daily Student 1 fairness behaviour scale showed excellent internal consistency reliability across all 10 daily surveys (Cronbach's αs ranging from .89 to .96, average α = .94).

The second measure was a behaviour count scale developed for Study 3. This scale comprised a list of 20 potential behaviours that a graduate student might engage in during their daily interactions with fellow graduate students. Ten of these behaviours were negative and disrespectful interpersonal behaviours. As mentioned previously, this kind of treatment runs counter to people's expectations about how they deserve to be treated, making it likely that these behaviours would be interpreted as unfair by the recipient (Bies & Moag, 1986; Greenberg, 1993). Example items are: "Said or did something hurtful to you," "Lost their temper at you," and "Lied to you." The other 10 behaviours were positive interpersonal behaviours that adhere to norms of fairness, and in many cases crossover into altruism. Example items are: "Passed along valuable information to you," "Helped you after you had been absent," and "Gave up time to help you with school-related problems." Participants were asked to indicate how many times Student 1 had engaged in each of the 20 behaviours that day using a 4-point frequency scale (where 0 = not at all, 1 = once, 2 = twice, and 3 = three or more times). The daily counts for all of the negative and positive behaviours were then summed to create a Student 1 negative behaviour count and a Student 1 positive behaviour count, respectively, for each day.[18]

[18] Most of the behaviour count items were designed to assess interpersonal and informational aspects of unfairness and fairness, rather than distributive and procedural aspects. This was done intentionally. Given that faculty supervisors, rather than graduate students, typically have control over outcomes and decisions in a graduate program environment, I reasoned that behaviours related to distributive and procedural aspects may be less common among graduate students.

See Appendix L for the instructions and a full list of the daily Student 1 fairness behaviour scale items, as well as a list of the Student 1 negative and positive behaviour count items.

Daily contact. At the beginning of each daily survey, Student 1 responded to two items assessing whether or not they had any contact with their faculty supervisor that day. Specifically, Student 1 was asked to indicate how many times they saw their supervisor that day, as well as how many times they spoke with their supervisor that day (either in person, over the phone, or via email). Similarly, the Student 2 daily survey also contained two items assessing whether or not Student 2 had any contact with Student 1 that day. Student 2 was asked to indicate how many times they saw Student 1 that day, as well as how many times they spoke to Student 1 (in person, over the phone, or via email). Each item was rated on a 4-point frequency scale (where 0 = not at all, 1 = once, 2 = twice, and 3 = three or more times). These data were used to select cases in which Student 1 had contact with their supervisor *and* Student 2 had contact with Student 1. In other words, any data that were collected on days when a) Student 1 did not see or talk to their faculty supervisor, or b) Student 2 did not see or talk to Student 1, were deemed "invalid" and excluded from the data analyses. See *Results* section for more details.

Control variables. As in Studies 1 and 2, gender was included as a control variable in Study 3. Unlike Studies 1 and 2, where all participants provided data on the criterion variable (meaning that gender could be controlled for using a single gender variable), the design of Study 3 was such that the criterion variable was Student 1's behaviour, as reported by Student 2. Thus, to ensure that the gender of all participants

was taken into consideration, it was necessary in Study 3 to control for both Student 1 and Student 2 gender as two separate variables.

A second set of control variables in Study 3 was Student 1 and Student 2's general attitudes toward each other. As mentioned above, the main criterion variable for Study 3 was Student 1's unfair and fair behaviour toward Student 2. In addition to the impact of independent and interdependent self-construals and supervisor unfairness, it seemed likely that Student 1's overall feelings about Student 2 might influence Student 1's behaviour toward Student 2. It also seemed likely that Student 2's overall feelings about Student 1 might influence Student 2's interpretation of Student 1's behaviour, as well as Student 2's propensity to report Student 1's unfair and fair behaviour. As such, I controlled for Student 1 and Student 2's general attitudes toward each other in the Study 3 analyses. Note that although the relationships between graduate students in Study 3 were presumably more complex than those between participants in Studies 1 and 2, controlling for general attitudes in Study 3 was also consistent with controlling for participants' evaluations of their partner in Studies 1 and 2.

A single item in the pre-study survey was used to assess Student 1's general attitude toward Student 2, and Student 2's general attitude toward Student 1. Specifically, each participant was asked to think about the other member of their pair and indicate their general attitude toward this person on a 7-point scale (where 1 = I strongly dislike this person, 7 = I like this person very much).

Results

Daily Survey Response Statistics

As mentioned previously in the *Method* section, participants were given the opportunity to complete 10 daily surveys over a 2-week period. In addition, both members of each pair were given the opportunity to "make up" as many as 5 surveys that they or their partner had missed during an additional third week. Frequently, in cases where one participant had missed more surveys than their partner, the "make up" surveys (which were completed by *both* members of each pair) resulted in one member of the pair completing more than 10 daily surveys. Therefore, the number of surveys completed by each participant over the revised 3-week daily survey period ranged from 8 to 14 ($M = 11$), with 97% of participants completing at least 10 daily surveys.

Recall that complete data were only available on days when both participants in each pair completed their respective daily surveys. Fifty-three pairs of participants provided complete data for 10 daily surveys, 4 pairs provided complete data for 9 daily surveys, and 1 pair provided complete data for 8 daily surveys, bringing the total number of complete daily observations (i.e., pairs of surveys containing both Student 1 and Student 2 data collected on the same day) to 574.

After the complete daily observations had been identified, it was necessary to identify and exclude all "invalid" pairs of surveys that were completed on days when Student 1 had no contact with their faculty supervisor, or when Student 2 had no contact with Student 1. When this had been accomplished, a total of 307 valid *and* complete daily observations remained for further analysis. The latter procedure had the effect of removing an additional two pairs of participants, whose complete daily

observations were *all* invalid due to a lack of contact between Student 1 and their supervisor, or between Student 1 and Student 2, on those days when both members of the pair had completed their daily surveys. This resulted in a final sample size of 56 pairs in the survey analyses. On average, each pair of participants provided 6 pairs of daily surveys that were both valid and complete.

Descriptive Statistics and Correlations among Study Variables

An alpha level of .05 was used for all statistical tests in Study 3. Table 5 gives the descriptive statistics and correlations among the variables measured during the daily surveys. Note, however, that these zero-order correlations are based on repeated, within-person measures, and should be interpreted with caution. As can be seen in Table 5, there was a significant positive zero-order correlation between daily supervisor treatment and Student 1 fairness behaviour, $r(291) = .34$, $p < .001$, suggesting that overall, participants in the Student 1 role were more likely to act unfairly toward Student 2 on days when they experienced unfair treatment from their supervisor. There was also a significant negative correlation between supervisor treatment and Student 1 daily program-based self-esteem, $r(297) = -.40$, $p < .001$. Consistent with Hypothesis 8, this zero- order correlation suggests that Student 1 participants experienced lower program-based self-esteem on days when they were treated more unfairly by their supervisor.

Unfortunately, the within-person, repeated measures data collected during the daily surveys were not directly comparable with the between-person data collected during the pre-study survey (see the following section, *Data Analytic Strategy*, for more on the multilevel structure of the dataset). Therefore, the descriptive statistics and

Table 5

Study 3: Descriptive Statistics and Correlations among Variables Assessed during the Daily Surveys

Variable	*M*	*SD*	1	2	3	4	5
1. Supervisor treatment	1.87	1.28	-				
2. Student 1 fairness behaviour	1.60	.89	.34***	-			
3. Student 1 negative behaviour	.55	1.40	.03	.28***	-		
4. Student 1 positive behaviour	3.34	3.37	-.11†	-.22***	.07	-	
5. Daily program-based self-esteem	5.33	1.17	-.40***	-.32***	-.10†	.04	-

Note. Due to missing data, *N* ranges from 292 to 306.

† $p < .10$. *** $p < .001$.

correlations among the variables measured during the pre-study survey are listed separately in Table 6.

Data Analytic Strategy

As implied in the previous section, the Study 3 data have a multilevel structure, in that each daily observation is nested within a pair of participants. In addition, there are repeated daily observations per pair. Hierarchical linear modeling, or HLM (Raudenbush & Bryk, 2002; Raudenbush, Bryk, Cheong, & Congdon, 2001) was developed to analyze multilevel datasets, including datasets with repeated within-person (or, in this case, within-pair) observations. In HLM terms, the daily observations of supervisor treatment and Student 1 behaviour collected during the daily surveys are at a lower level of analysis (Level 1), and the individual difference measures (Student 1 independent and interdependent self-construals, Student 1 baseline program-based self-esteem, Student 1 perceptions of the fairness environment, and Student 1 and Student 2 gender) collected during the pre-study surveys are at a higher level of analysis (Level 2).

The advantage of using HLM when analyzing multilevel data is that HLM models within-person and between-person variation in the criterion variable simultaneously. This represents an improvement over other techniques, which require either disaggregating or aggregating the data prior to analysis (Hofmann, 1997; Raudenbush & Bryk, 2002). Disaggregating the data treats each observation as though it is independent by examining all variables at the lower level of analysis. In the current dataset, this would involve treating each daily observation as though it came from a different pair by repeatedly assigning the same Student 1 independent and

Table 6

Study 3: Descriptive Statistics and Correlations among Variables Assessed during the Pre-Study Survey

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Independent self-construal	3.82	1.01	-							
2. Interdependent self-construal	5.00	.63	.24†	-						
3. Fairness environment	5.28	.90	-.12	.17	-					
4. Baseline program-based self-esteem	5.39	1.06	-.23†	-.21	.30*	-				
5. Student 1 general attitude	5.91	1.16	-.16	.05	.05	-.11	-			
6. Student 2 general attitude	6.29	.73	-.16	.15	.13	.15	.45***	-		
7. Student 1 gender	.46	.50	.10	-.06	.13	.21	-.20	-.14	-	
8. Student 2 gender	.31	.47	-.15	-.07	.07	.09	-.02	-.22†	.34**	-

Note. $N = 58$. Student 1 and Student 2 gender were dummy-coded, such that males were assigned a "1" and females were assigned a "0." All other variables were measured on a 7-point scale.

† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

interdependent self-construal scores, for example, to each observation that came from the same pair. Obviously, this technique violates the assumption of independence of observations required to conduct traditional regression analyses. In contrast, aggregating the data averages across all of the lower level observations for each higher level unit. In the current dataset, this would involve averaging across all of the daily observations of supervisor treatment and Student 1 behaviour for each pair of participants. Unfortunately, this technique results in the loss of any within-person variance in the criterion variable, and eliminates any within-person relations between variables at the lower level of analysis. For example, aggregating the data would mask over any day-to-day variation in Student 1 behaviour that may have been caused by day-to-day variation in supervisor treatment.

By modeling both within-person and between-person variance in the criterion variable, HLM allows researchers to simultaneously examine relations between the criterion variable and variables at the within-person level of analysis and between-person level of analysis, as well as "cross-level" interactions involving both within and between-person variables. In Hypotheses 6 and 7, I predicted that Student 1's independent and interdependent self-construals would interact with the daily treatment they experience from their supervisor to influence Student 1's daily behaviour toward Student 2. Both of these hypotheses describe a cross-level interaction, in which a variable measured at the higher level of analysis (in Hypothesis 6, independent self-construal, and in Hypothesis 7, interdependent self-construal) interacts with a variable measured at the lower level of analysis (Student 1's daily treatment from the supervisor) to influence a criterion variable also measured at the lower level of

analysis[19] (Student 1's daily behaviour toward Student 2). In other words, these cross-level hypotheses suggest that the relationship between Student 1's daily treatment from their supervisor and Student 1's daily behaviour toward Student 2 (based on multiple observations over a series of days[20]) will differ for each person, depending on their level of independent or interdependent self-construal.

In Hypothesis 8, I predicted that participants in the Student 1 role would report lower daily program-based self-esteem on days when they experienced more unfair treatment from their supervisor, as compared to days when they experienced less unfair treatment from their supervisor, controlling for baseline program-based self-esteem. Although both the predictor and criterion variables in this hypothesis were measured at the within-person level of analysis and could theoretically be examined using regular multiple regression, the control variable (program-based self-esteem) was measured at the between-person level of analysis. As such, HLM was used to examine the impact of daily supervisor treatment on daily program-based self-esteem, controlling for individual differences in baseline program-based self-esteem.

Hypotheses 9 and 10 predicted three-way interactions of self-construal, daily supervisor treatment, and fairness environment on Student 1's behaviour toward Student 2. Specifically, Hypothesis 9 predicted that participants in the Student 1 role with a strong independent self-construal would be even more likely to behave unfairly toward Student 2 on days when they were treated more unfairly by their supervisor if they perceived a weak, as opposed to strong, fairness environment in their graduate program. In contrast, Hypothesis 10 predicted that participants in the Student 1 role

[19] Note that the criterion variable in HLM is *always* measured at the lower level of analysis.
[20] Note that HLM allows for unequal numbers of within-person (or within-pair) observations at the lower level of analysis and gives more weight to individuals who provide more observations.

with a strong interdependent self-construal would be even more likely to behave fairly toward Student 2 on days when they were treated more unfairly by their supervisor if they perceived a strong, as opposed to weak, fairness environment in their graduate program. The three-way interactions proposed in these hypotheses represent cross-level interactions involving two variables measured at the between-person level of analysis (either independent or interdependent self-construal and fairness environment) and one variable measured at the within-person level of analysis (daily supervisor treatment).

Recall that Student 2's daily perceptions of Student 1's behaviour were assessed using two different measures: an 8-item fairness behaviour scale and a 20-item negative and positive behaviour count scale. Given that count data are often positively skewed, the frequency distributions of both the negative and positive behaviour count variables were examined. As expected, both variables were positively skewed and appeared to follow a Poisson distribution rather than a normal distribution. As a result, the standard linear version of HLM was used to analyze models in which the fairness behaviour scale was the criterion variable, whereas the Poisson extension of HLM was used to analyze models in which the negative and positive behaviour count scales were the criterion variables.[21] Due to the within-person nature of the Study 3 dataset, all models were constructed using the "measures within person" data-nesting option.

[21] The Poisson extension of HLM provides unit-specific and population-average results for every model. These results offer different interpretations of the data, and which interpretation a researcher chooses should be driven by the nature of the research question. In the current study, the unit-specific results describe how changes in supervisor treatment influence a single student's behaviour toward a fellow graduate student. By contrast, the population-average results describe how changes in supervisor treatment influence students' behaviours toward fellow graduate students across the entire sample of participants. Because I was more interested in describing behaviours across the entire sample, rather looking at each participant individually, I chose to interpret the population-average results. Note that the distinction between unit-specific and population-average results is not made in standard linear HLM (see Raudenbush, Bryk, Cheong, & Congdon, 2001).

As mentioned previously, a major advantage of HLM is that it allows the researcher to model within-person and between-person variation in the criterion variable simultaneously. The researcher is also permitted specify the structure of the Level 1 and Level 2 variance components in each model by choosing either to allow these variance components to vary (recognizing that residual variances may differ from person to person), or to restrict one or more of these components to zero (specifying that residual variances are homogenous across participants). Erring on the side of caution, I allowed these variance components to vary at both levels of analysis. In addition, HLM provides two sets of significance tests based on robust and non-robust standard errors. I chose to report the significance tests based on robust standard errors, which are less sensitive to misspecification of the residual variance components.

Compared to regular regression models in which the choice between entering variables in their raw metric versus mean-centered is quite straightforward, the multilevel structure of HLM models provides three options for centering Level 1 variables and two options for centering Level 2 variables. The choice of centering for Level 1 variables—and to a lesser extent, Level 2 variables—in HLM is a complex and important decision that can have a major impact on the interpretation of the results (Enders & Tofighi, 2007; Hofmann & Gavin, 1998; Raudenbush & Bryk, 2002). Although variables at both levels can be entered in their raw metric, this approach is rarely recommended, even for dichotomous (i.e., dummy-coded) predictors. At Level 1, one option is to center variables around their group mean (also known as "group-mean centering" or "centering within cluster"). In Study 3, where the "group" is actually comprised of repeated within-person observations, group-mean centering effectively

centers each person's scores around their own mean. The second option is grand-mean centering, in which each Level 1 observation is centered around the grand mean of all observations (i.e., across all participants). At Level 2, group-mean centering is not available, making grand-mean centering the only alternative to raw metric scaling.

Whether Level 1 variables should be group-mean centered or grand-mean centered has been shown to depend on the research question and the nature of the effects specified in the model (Enders & Tofighi, 2007; Hofmann & Gavin, 1998; Raudenbush & Bryk, 2002). In the Study 3 analyses, I used group-mean centering for all Level 1 predictors and grand-mean centering for all Level 2 predictors, which has been shown to be most appropriate when examining cross-level interactions such as the ones proposed in Hypotheses 6, 7, 9 and 10. Group-mean centering has also been shown to be most appropriate when one is primarily interested in examining the effect of a Level 1 predictor on the criterion variable, making group-mean centering at Level 1 the best choice for testing Hypothesis 8 as well (see Enders & Tofighi, 2007).

For ease of exposition, the following results are organized by criterion variable. For the first criterion variable, Student 1 fairness rating, I describe the HLM equations and results examining the interactions of participants' independent and interdependent self-construals with supervisor treatment (simultaneously testing Hypotheses 6 and 7). I then present the HLM equations and results examining the three-way interactions of the two self-construals with fairness environment and supervisor treatment, again using Student 1 fairness behaviour as the criterion variable (testing Hypotheses 9 and 10).

For the second criterion variable, Student 1 negative behaviour, I describe the HLM equations and results examining the interaction between independent self-

construal and supervisor treatment (providing a second test of Hypothesis 6). This is followed by the HLM equations and results testing the three-way interaction among independent self-construal, fairness environment, and supervisor treatment on the same negative behaviour criterion variable (a second test of Hypothesis 9).

For the third criterion variable, Student 1 positive behaviour, I present the HLM equations and findings for the interaction between interdependent self-construal and supervisor treatment (a second test of Hypothesis 7). I then present the equations and findings for the three-way interaction among interdependent self-construal, fairness environment, and supervisor treatment with the same positive behaviour criterion variable (a second test of Hypothesis 10).

Finally, I present the HLM equations and results examining the effect of supervisor treatment on the fourth criterion variable, daily program-based self-esteem (testing Hypothesis 8).

For a complete summary of the Study 3 hypotheses and results, see Appendix M.

Student 1 Fairness Behaviour

Hypotheses 6 and 7 HLM equations. Hypotheses 6 and 7 predicted that Student 1's independent and interdependent self-construals would interact with the daily treatment they experienced from their supervisor to influence Student 1's daily behaviour toward Student 2. These hypotheses were first tested with the 8-item daily Student 1 fairness behaviour scale as the criterion variable.

At Level 1, the within-person level of analysis, I included Student 1 daily ratings of supervisor treatment as a predictor. Accordingly, the Level 1 equation was:

$$Y = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where Y was Student 2 daily ratings of Student 1 fairness behaviour, P_0 was the Level 1 intercept (estimated separately for each Student 1 participant)[22], P_1 was the effect of supervisor treatment on Y (or slope, estimated separately for each Student 1 participant—see Level 2 equations below), and e was the Level 1 residual variance.

Any variables entered at Level 2, the between-person level of analysis in HLM, must be specified as moderators of the Level 1 intercept, Level 1 slope, or both. Note that Level 2 moderators of the Level 1 intercept have a main effect-like impact on the criterion variable, whereas moderators of the Level 2 slope generate a cross-level interaction with the Level 1 slope predictor (in this case, daily supervisor treatment). To control for any main effects of Student 1 and 2 general attitudes toward each other, as well as any effects of Student 1 and Student 2 gender, these four control variables were entered as predictors of the Level 1 intercept.[23] Student 1 independent and interdependent self-construals were also entered as predictors of the Level 1 intercept. This was done to control for any main effects of the two self-construals, and was considered a pre-requisite for testing the two cross-level interactions between independent and interdependent self-construals and supervisor treatment. These cross-level interactions were tested by entering Student 1 independent and interdependent self-construals as moderators of the Level 1 slope.

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[22] "P" stands for the Greek letter Rho. In HLM models using a "measures within person" data structure, P is used to represent Level 1 coefficients and B (Beta) is used to represent Level 2 coefficients. This should not be confused with models using a "persons within groups" data structure (not seen in Study 3), in which B is used to represent Level 1 coefficients and G (Gamma) is used to represent Level 2 coefficients. It should also be noted that HLM output uses English letters rather than Greek letters, and this convention appears to have been adopted by some authors when reporting HLM results.

[23] Although I anticipated that the control variables may have main effects on Student 1's fair and unfair behaviour as rated by Student 2, I did not anticipate any interactions of these control variables with supervisor treatment; therefore, the control variables were not included in the slope equation.

The results of the full model revealed no main effects of Student 1 or Student 2 gender on Student 1 fairness behaviour. As a result, both Student 1 and Student 2 gender were trimmed from the Level 2 model. There was, however, a significant main effect of Student 2 general attitude toward Student 1 on Student 1 fairness behaviour; therefore, both general attitude control variables were retained. Thus, the Level 2 intercept and slope equations in the revised model were:

$P_0 = B_{00} + B_{01}$ * (Student 1 general attitude) + B_{02} * (Student 2 general attitude) + B_{03} * (independent self-construal) + B_{04} * (interdependent self-construal) + r_0

and

$P_1 = B_{10} + B_{11}$ * (independent self-construal) + B_{12} * (interdependent self-construal) + r_1

where B_{00} was the Level 2 intercept, B_{01} - B_{04} were the main effects of variables defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope (also the main effect) of supervisor treatment, B_{11} was the cross-level interaction between independent self-construal and supervisor treatment, B_{12} was the cross-level interaction between interdependent self-construal and supervisor treatment, and r_1 was the residual variance in the slope.

Hypotheses 6 and 7 findings. The results for the revised model are shown in Table 7. These results indicated no significant main effect of Student 1 general attitude toward Student 1 (B_{01} = .07, *SE* = .08), $t(51) = .90$, $p = .37$, but a significant main effect of Student 2 general attitude toward Student 1 (B_{02} = -.52, *SE* = .14), $t(51) = -3.86$, $p < .001$. The direction of this effect suggested that Student 2 participants who indicated a stronger liking for Student 1 during the pre-study survey were less likely to rate Student

Table 7

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Fairness Behaviour as a Function of Independent Self-Construal, Interdependent Self-Construal, and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*
Intercept	B_{00}	1.57***	.08
Student 1 general attitude	B_{01}	.07	.08
Student 2 general attitude	B_{02}	-.52***	.14
Independent self-construal	B_{03}	.03	.11
Interdependent self-construal	B_{04}	-.01	.17
Supervisor treatment	B_{10}	-.06	.05
Independent self-construal x supervisor treatment	B_{11}	.09***	.02
Interdependent self-construal x supervisor treatment	B_{12}	-.20*	.09

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

1 as being unfair on a daily basis than Student 2 participants who indicated a stronger disliking for Student 1. There were no main effects of either independent or interdependent self-construal (B_{03} = .03, *SE* = .11), $t(51) = .31$, $p = .76$, and (B_{04} = -.01, *SE* = .17), $t(51) = -.06$, $p = .96$, respectively.

Although the overall effect (average slope) of supervisor treatment on Student 1 fairness behaviour was not significant (B_{10} = -.06, *SE* = .04), $t(53) = -1.26$, $p = .22$, this slope was significantly moderated by both independent self-construal (B_{11} = .09, *SE* = .02), $t(53) = 3.87$, $p < .001$, and interdependent self-construal (B_{12} = -.20, *SE* = .09), $t(53) = -2.16$, $p = .04$.

A plot of the cross-level interaction between independent self-construal and supervisor treatment is shown in Figure 3. Hypothesis 6 predicted that Student 1 would be more likely to act unfairly toward Student 2 on days when they felt unfairly treated by their supervisor if they had a strong, versus weak, independent self-construal. This hypothesis was not supported. Instead, the interaction revealed that Student 1 was more likely to act *fairly* toward Student 2 on days when they felt unfairly treated by their supervisor if they had a *weak*, as compared to strong, independent self-construal. In addition, supervisor treatment had no impact on Student 1's fairness toward Student 2 among Student 1 participants with a strong independent self-construal.

Hypothesis 7 predicted that Student 1 would be more likely to act fairly toward Student 2 on days when they felt unfairly treated by their supervisor if they had a strong, versus weak, interdependent self-construal. This hypothesis was supported. As depicted in Figure 4, the cross-level interaction between interdependent self-construal and supervisor treatment showed that participants in the Student 1 role did act more

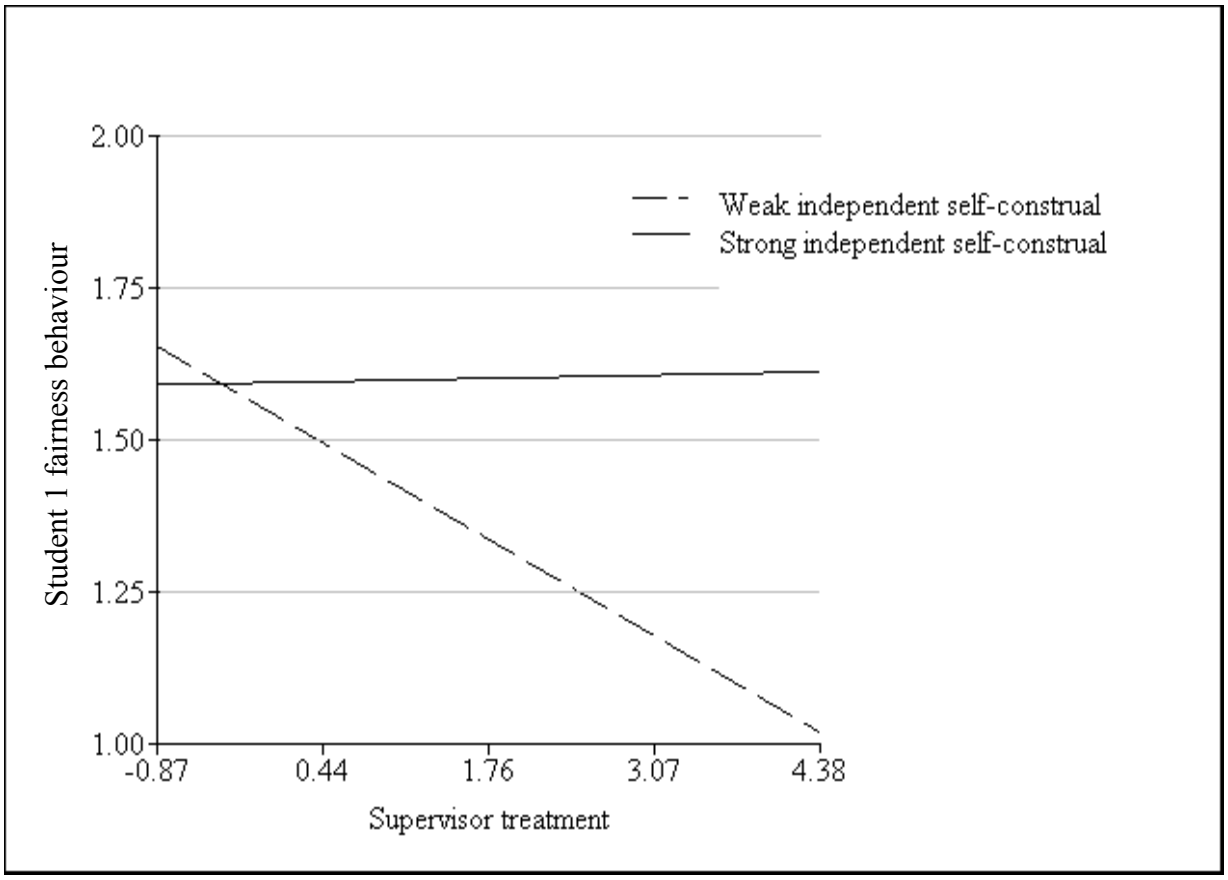

Figure 3. Cross-level interaction of independent self-construal and supervisor treatment[24] predicting Student 1 fairness behaviour toward Student 2[25]

[24] Like all Level 1 predictors, supervisor treatment has been group-mean centered. In Figures 3, 4, 5, and 6, the values on the x-axis represent the full range of the group-mean centered supervisor treatment scale, with lower values indicating fair treatment and higher values indicating unfair treatment.

[25] In Figures 3 and 4, values on the y-axis range from 1 to 7, with lower values indicating fair behaviour and higher values indicating unfair behaviour.

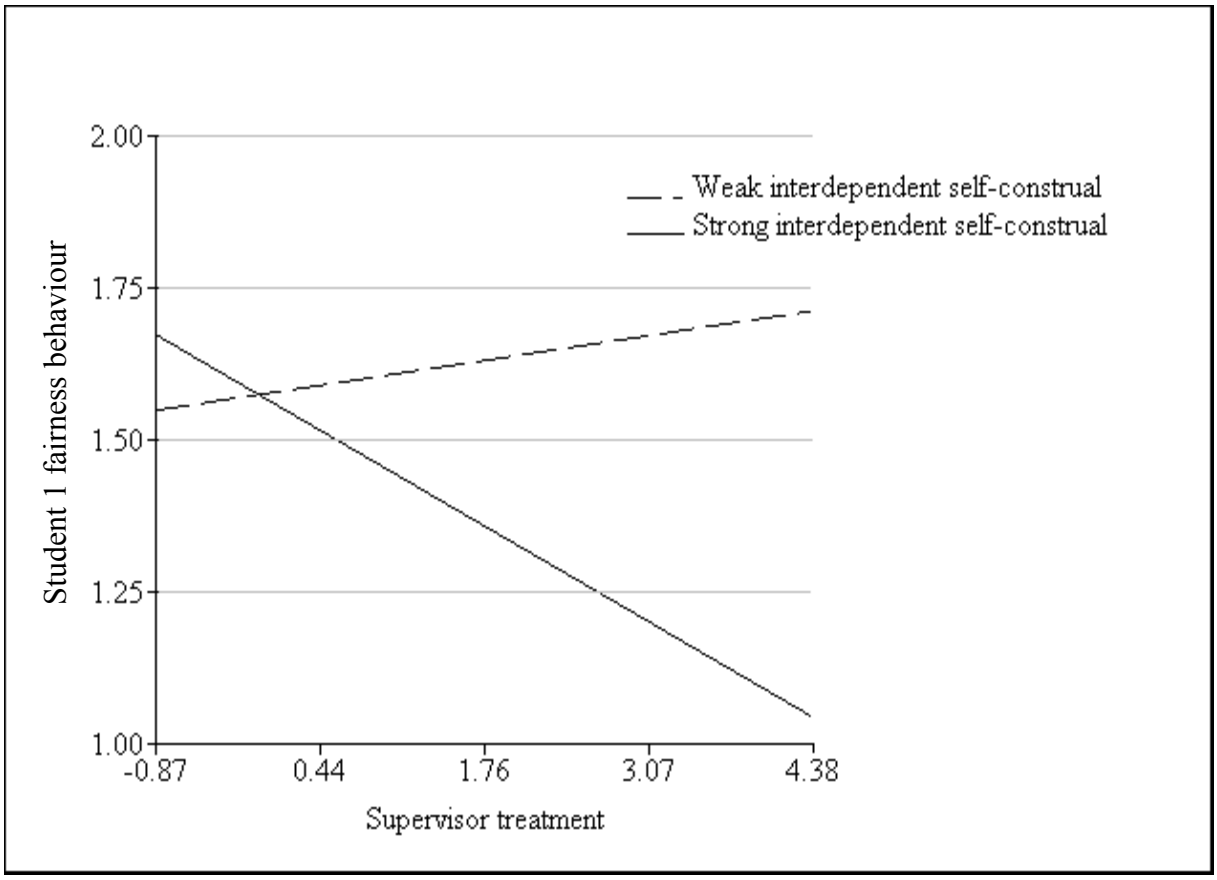

Figure 4. Cross-level interaction of interdependent self-construal and supervisor treatment predicting Student 1 fairness behaviour toward Student 2

fairly toward Student 2 on days when they reported being more unfairly treated by their supervisor if they had a stronger, rather than weaker, interdependent self-construal.

Hypotheses 9 and 10 HLM equations. Hypotheses 9 and 10 predicted that Student 1's perceptions of the fairness environment would moderate the interactions between Student 1's independent and interdependent self-construals and the daily treatment they received from their supervisor, creating three-way, cross-level interactions. Specifically, Hypothesis 9 predicted that participants with a strong independent self-construal would be especially likely to act unfairly toward Student 2 on days when they felt more unfairly treated by their supervisor if they perceived a weak fairness environment in their graduate program. In contrast, Hypothesis 10 predicted that participants with a strong, as opposed to weak, interdependent self-construal would be especially likely to act fairly toward Student 2 on days when they felt more unfairly treated by their supervisor if they perceived a strong fairness environment. Like Hypotheses 6 and 7, Hypotheses 9 and 10 were first tested with the 8-item daily Student 1 fairness behaviour scale as the criterion variable.

The Level 1 model for this analysis was identical to the Level 1 model used to test Hypotheses 6 and 7. As before:

$$Y = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where Y was Student 2 daily ratings of Student 1 fairness behaviour, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment on Y, and e was the Level 1 residual variance.

At Level 2, the main effects of Student 1 and 2 general attitudes toward each other were controlled by entering these two variables as predictors of the Level 1

intercept (the Student 1 and Student 2 gender variables were omitted due to their non-significance in the previous model with the same criterion variable). Similar to the previous model, Student 1 independent and interdependent self-construals and perceptions of the fairness environment were entered as predictors of the Level 1 intercept to control for any main effects of these variables.

As a pre-requisite to testing the three-way cross-level interactions proposed in Hypotheses 9 and 10, it was necessary to control for a number of two-way interactions. First, the two-way interactions between the variables assessed at the between-person level of analysis (independent self-construal x fairness environment and interdependent self-construal x fairness environment) were added as predictors of the Level 1 intercept, thus controlling for each of these two-way interactions. Second, the three variables assessed at the between-person level of analysis (independent self-construal, interdependent self-construal, and fairness environment) were each entered as predictors of the Level 1 slope. Because all predictors of the Level 1 slope are by default moderators of the Level 1 independent variable (in this case, supervisor treatment), this controlled for each of their two-way interactions with supervisor treatment.

Finally, the three-way cross-level interactions were tested by entering the two-way interactions between independent self-construal and fairness environment, and between interdependent self-construal and fairness environment, as moderators of the Level 1 slope. The Level 2 intercept and slope equations were therefore:

$$P_0 = B_{00} + B_{01} * (\text{Student 1 general attitude}) + B_{02} * (\text{Student 2 general attitude}) + B_{03} * (\text{independent self-construal}) + B_{04} * (\text{interdependent self-construal}) +$$

B_{05} * (fairness environment) + B_{06} * (independent self-construal x fairness environment) + B_{07} * (interdependent self-construal x fairness environment) + r_0

and

$P_1 = B_{10} + B_{11}$ * (independent self-construal) + B_{12} * (interdependent self-construal) + B_{13} * (fairness environment) + B_{14} * (independent self-construal x fairness environment) + B_{15} * (interdependent self-construal x fairness environment) + r_1

where B_{00} was the Level 2 intercept, B_{01} - B_{05} were the main effects of variables defined at Level 2, B_{06} and B_{07} were the two-way interactions between variables defined at Level 2, r_0 is the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, $B_{11} – B_{13}$ were the two-way cross-level interactions between variables defined at Level 2 and supervisor treatment (defined at Level 1), B_{14} was the three-way cross-level interaction between independent self-construal, fairness environment, and supervisor treatment, B_{15} was the three-way cross-level interaction among interdependent self-construal, fairness environment, and supervisor treatment, and r_1 was the residual variance in the slope.

Hypotheses 9 and 10 findings. The results, shown in Table 8, revealed significant main effects of several control variables, including Student 1 and Student 2 general attitudes toward each other. In this model, Student 1 participants who indicated a stronger liking for Student 2 actually acted more unfairly toward Student 2 than Student 1 participants who indicated a stronger disliking for Student 2 (B_{01} = .15, SE = .07), $t(48) = 2.06$, p = .04. Consistent with the previous model, Student 2 participants who indicated a stronger liking for Student 1 were less likely to rate Student 1 as being

Table 8

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Fairness Behaviour as a Function of Independent Self-Construal, Interdependent Self-Construal, Fairness Environment, and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*
Intercept	B_{00}	1.54***	.07
Student 1 general attitude	B_{01}	.15*	.07
Student 2 general attitude	B_{02}	-.51***	.13
Independent self-construal	B_{03}	.00	.09
Interdependent self-construal	B_{04}	.01	.16
Fairness environment	B_{05}	-.11	.08
Independent self-construal x fairness environment	B_{06}	-.28***	.07
Interdependent self-construal x fairness environment	B_{07}	.02	.16
Supervisor treatment	B_{10}	-.07	.05
Independent self-construal x supervisor treatment	B_{11}	.11*	.04
Interdependent self-construal x supervisor treatment	B_{12}	-.22*	.09
Fairness environment x supervisor treatment	B_{13}	-.00	.09

Description of effect	Coefficient name	Coefficient estimate	*SE*
Independent self-construal x fairness environment x supervisor treatment	B_{14}	.02	.05
Interdependent self-construal x fairness environment x supervisor treatment	B_{15}	-.13	.12

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

unfair than Student 2 participants who indicated a stronger disliking for Student 1 (B_{02} = -.51, *SE* = .13), *t*(48) = -3.87, *p* < .001. The two-way interaction between independent self-construal and fairness environment (entered as a control variable in the Level 1 intercept equation) was also significant (B_{06} = -.28, *SE* = .07), *t*(48) = -3.87, *p* < .001. Although this two-way interaction was not of primary interest in Study 3, a plot of this interaction revealed that Student 1 participants with a strong independent self-construal who perceived the fairness environment in their graduate program to be strong acted more fairly on a daily basis than those who perceived the fairness environment to be weak.

As in the previous model, there were no main effects of independent self-construal or interdependent self-construal (B_{03} = .00, *SE* = .09), *t*(48) = .05, *p* = .96, and (B_{04} = .01, *SE* = .16), *t*(48) = .06, *p* = .95. There was also no main effect of fairness environment (B_{05} = -.11, *SE* = .08), *t*(48) = -1.30, *p* = .20, and no interaction between interdependent self-construal and fairness environment (B_{07} = .02, *SE* = .16), *t*(48) = .15, *p* = .88.

The overall effect of supervisor treatment on Student 1 fairness behaviour remained non-significant (B_{10} = -.07, *SE* = .05), *t*(50) = -1.40, *p* = .17, and the results for the two-way cross-level interactions of interdependent and independent self-construal with supervisor treatment remained significant and in the same direction as in the previous model (B_{11} = .11, *SE* = .04), *t*(50) = 2.52, *p* = .02, and (B_{12} = -.22, *SE* = .09), *t*(50) = -2.50, *p* = .02, respectively. There was no two-way cross-level interaction of fairness environment and supervisor treatment (B_{13} = -.00, *SE* = .09), *t*(50) = -.03, *p* = .98.

The results for the three-way cross-level interactions revealed that, contrary to Hypothesis 9, Student 1 perceptions of the fairness environment did not moderate the cross-level interaction between independent self-construal and supervisor treatment (B_{14} = .02, *SE* = .05), $t(50) = .30$, $p = .76$. Hypothesis 10 was also not supported, as Student 1 perceptions of the fairness environment failed to moderate the cross-level interaction between interdependent self-construal and supervisor treatment (B_{15} = -.13, *SE* = .12), $t(50) = -1.09$, $p = .28$.

Student 1 Negative Behaviour

Hypothesis 6 HLM equations. Hypothesis 6 predicted that participants in the Student 1 role would be more likely to act unfairly toward Student 2 on days when they felt more unfairly treated by their supervisor if they had a strong, as compared to weak, independent self-construal. Although this hypothesis did not receive support in the models with Student 1 fairness behaviour as the criterion variable, the Student 1 negative behaviour criterion variable provided a second opportunity to test Hypothesis 6.

As mentioned previously, the Poisson extension of HLM was used to analyze models in which behaviour counts were the criterion variables. The basic logic of these HLM models remains the same, except that the outcome variable and model coefficients are expressed in a logarithmic metric. For this model, the Level 1 equation was:

$$\log (L) = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where L[26] was the number of daily Student 1 negative behaviours, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment, and e was the Level 1 residual variance.

At Level 2, the main effects of Student 1 and 2 general attitudes toward each other and Student 1 and Student 2 gender were controlled by entering these variables as predictors of the Level 1 intercept. Student 1 independent self-construal was also entered as a predictor of the Level 1 intercept to control for any main effects of independent self-construal. Note that, although interdependent self-construal was not being tested as a moderator of the effect of supervisor treatment on Student 1 negative behaviour toward Student 2, there was a marginally significant positive correlation between participants' independent and interdependent self-construals in Study 3. As such, Student 1 interdependent self-construal was entered as a control variable in the Level 1 intercept equation. Finally, independent self-construal was tested as a cross-level moderator of the effect of supervisor treatment on Student 1 daily negative behaviour by entering independent self-construal as a predictor of the Level 1 slope.

The Level 2 equations for the model predicting Student 1 daily negative behaviour were as follows:

$$P_0 = B_{00} + B_{01} * (\text{Student 1 general attitude}) + B_{02} * (\text{Student 2 general attitude}) + + B_{03} * (\text{Student 1 gender}) + B_{04} * (\text{Student 2 gender}) + B_{05} * (\text{independent self-construal}) + B_{06} * (\text{interdependent self-construal}) + r_0$$

and

$$P_1 = B_{10} + B_{11} * (\text{independent self-construal}) + r_1$$

[26] "L" stands for the Greek letter Lambda, and may also be written as λ.

where B_{00} was the Level 2 intercept, B_{01} - B_{06} were the main effects of variables defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, B_{11} was the cross-level interaction between independent self-construal and supervisor treatment, and r_1 was the residual variance in the slope.

Hypothesis 6 findings. The results for the model testing the interaction between independent self-construal and supervisor treatment on Student 1 negative behaviour model are shown in Table 9. There were significant main effects for many of the control variables, including Student 1 and Student 2 general attitudes toward each other and Student 2 gender, as well as marginal main effects for independent and interdependent self-construals. The findings for Student 1 and Student 2 general attitudes toward each other were consistent with the Student 1 fairness behaviour models. Specifically, Student 1 participants who indicated a stronger liking for Student 2 engaged in more negative behaviours toward Student 2 than Student 1 participants who indicated a stronger disliking for Student 2 (B_{01} = .33, SE = .13)[27], $t(49) = 2.54$, p = .01. In addition, Student 2 participants who indicated a stronger liking for Student 1 reported fewer daily negative behaviours from Student 1 than Student 2 participants who indicated a stronger disliking for Student 1 (B_{02} = -.45, SE = .17), $t(49) = -2.63$, p = .01. The main effect of Student 1 gender was not significant (B_{03} = -.28, SE = .28),

[27] Recall that coefficients in models using the Poisson extension of HLM are expressed in a logarithmic metric. Although the general direction of these effects can be discerned by the valence of their coefficients, the meaning of each coefficient is more easily interpreted by examining the associated event rate ratio. The event rate ratio is provided in the HLM output, and can also be calculated using the simple formula: exp(coefficient). In the current example, a coefficient of .33 represents the expected difference in the log-negative behaviour count associated with a single unit increase in Student 1 general attitude toward Student 2, holding constant the other variables in the analysis. This coefficient corresponds to an event rate ratio of 1.39, which means that the daily negative behaviour count of Student 1 increases 1.39 times for every 1 point increase in Student 1 general attitude toward Student 2. Note that positive coefficients translate into event rate ratios that are greater than 1, indicating an increase in the behaviour count associated with an increase in the variable of interest. In contrast, negative coefficients translate into event rate ratios that are less than 1, indicating a decrease in the behaviour count associated with an increase in the variable of interest.

Table 9

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Negative Behaviour as a Function of Independent Self-Construal and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*	Event rate ratio
Intercept	B_{00}	-.92***	.13	.40
Student 1 general attitude	B_{01}	.33*	.13	1.39
Student 2 general attitude	B_{02}	-.45*	.17	.64
Student 1 gender	B_{03}	-.28	.28	.76
Student 2 gender	B_{04}	.81*	.32	2.25
Independent self-construal	B_{05}	.26†	.14	1.30
Interdependent self-construal	B_{06}	-.45†	.23	.64
Supervisor unfairness	B_{10}	-.14*	.06	.87
Independent self-construal x supervisor treatment	B_{11}	-.01	.03	.99

Note. Gender: male = 1, female = 0.

† $p < .10$. * $p < .05$. *** $p < .001$.

$t(49) = -.97$, $p = .34$. However, a significant effect of Student 2 gender revealed that male participants in the Student 2 role were more likely than females to report daily negative behaviours from Student 1 ($B_{04} = .81$, $SE = .32$), $t(49) = 2.55$, $p = .01$. The main effect of independent self-construal revealed that Student 1 participants with a strong, compared to a weak, independent self-construal were marginally more likely to display negative behaviours ($B_{05} = .26$, $SE = .14$), $t(49) = 1.84$, $p = .07$. An additional main effect of interdependent self-construal indicated that Student 1 participants with a strong, compared to a weak, interdependent self-construal were marginally less likely to display negative behaviours ($B_{06} = -.45$, $SE = .23$), $t(49) = -1.96$, $p = .06$.

The overall slope of supervisor treatment on Student 1 daily negative behaviour was significant ($B_{10} = -.14$, $SE = .06$), $t(54) = -2.37$, $p = .02$, such that the negative behaviour count was actually lower on days when Student 1 experienced more unfair treatment from their supervisor. In addition, there was no cross-level interaction between Student 1 independent self-construal and negative behaviour ($B_{11} = -.01$, $SE = .03$), $t(54) = -.27$, $p = .79$, indicating a lack of support for Hypothesis 6.

Hypotheses 9 HLM equations. Hypothesis 9 predicted that the cross-level interaction between independent self-construal and supervisor treatment proposed in Hypothesis 6 would be moderated by Student 1's perceptions of the fairness environment, creating a three-way, cross-level interaction. This hypothesis was not supported with Student 1 fairness behaviour as the criterion variable, but was tested for a second time with Student 1 negative behaviour as the criterion variable.

The Level 1 model for this analysis was the same as the Level 1 model used to test Hypothesis 6 with Student 1 negative behaviour as the criterion variable:

$$\log (L) = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where L was the number of daily Student 1 negative behaviours, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment, and e was the Level 1 residual variance.

At Level 2, the main effects of Student 1 and 2 general attitudes toward each other and Student 1 and Student 2 gender were controlled by entering these variables as predictors of the Level 1 intercept. Although independent self-construal was of primary interest in Hypothesis 6, the main effects of both independent and interdependent self-construals were controlled due to the marginally positive correlation between the two. The main effect of Student 1 perceptions of the fairness environment was also added as a control variable in the Level 1 intercept equation.

To test the three-way cross-level interaction among the independent self-construal, fairness environment, and supervisor treatment variables, it was necessary to control for the two-way interaction between independent self-construal and fairness environment by adding this interaction as a predictor of the Level 1 intercept. In addition, the two-way cross-level interactions of independent self-construal and supervisor treatment, and of fairness environment and supervisor treatment, were controlled by entering independent self-construal and fairness environment as predictors of the Level 1 slope. The three-way cross-level interaction was then tested by adding the two-way interaction between independent self-construal and fairness environment as a predictor of the Level 1 slope. The resulting Level 2 intercept and slope equations were as follows:

$P_0 = B_{00} + B_{01} * (\text{Student 1 general attitude}) + B_{02} * (\text{Student 2 general attitude}) + B_{03} * (\text{Student 1 gender}) + B_{04} * (\text{Student 2 gender}) + B_{05} * (\text{independent self-construal}) + B_{06} * (\text{interdependent self-construal}) + B_{07} * (\text{fairness environment}) + B_{08} * (\text{independent self-construal x fairness environment}) + r_0$

and

$P_1 = B_{10} + B_{11} * (\text{independent self-construal}) + B_{12} * (\text{fairness environment}) + B_{13} * (\text{independent self-construal x fairness environment}) + r_1$

where B_{00} was the Level 2 intercept, B_{01} - B_{07} were the main effects of variables defined at Level 2, B_{08} was the two-way interaction between variables defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, B_{11} and B_{12} were the two-way cross-level interactions between variables defined at Level 2 and supervisor treatment (defined at Level 1), B_{13} was the three-way cross-level interaction among independent self-construal, fairness environment, and supervisor treatment, and r_1 was the residual variance in the slope.

Hypothesis 9 results. The results for the current model, shown in Table 10, revealed most of the same significant main effects as the previous model with Student 1 negative behaviour as the criterion variable. As in the previous model, Student 1 participants who indicated a stronger liking for Student 2 engaged in more negative behaviours directed at Student 2 than Student 1 participants who indicated a stronger disliking for Student 2 (B_{01} = .63, SE = .13), $t(47) = 4.92$, $p < .001$. Also as before, Student 2 participants who indicated a stronger liking for Student 1 reported fewer negative behaviours by Student 1 than Student 2 participants who indicated a stronger disliking for Student 1 (B_{02} = -.46, SE = .18), $t(47) = -2.58$, $p = .01$. The main effect of

Table 10

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Negative Behaviour as a Function of Independent Self-Construal, Fairness Environment, and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*
Intercept	B_{00}	-1.07***	.14
Student 1 general attitude	B_{01}	.63***	.13
Student 2 general attitude	B_{02}	-.46**	.18
Student 1 gender	B_{03}	-.09	.25
Student 2 gender	B_{04}	.77**	.31
Independent self-construal	B_{05}	.21	.13
Interdependent self-construal	B_{06}	-.50**	.20
Fairness environment	B_{07}	.20	.17
Independent self-construal x fairness environment	B_{08}	-.57***	.12
Supervisor treatment	B_{10}	-.23**	.08
Independent self-construal x supervisor treatment	B_{11}	-.13**	.03
Fairness environment x supervisor treatment	B_{12}	-.11††	.06

Description of effect	Coefficient name	Coefficient estimate	*SE*
Independent self-construal x fairness environment x supervisor treatment	B_{13}	-.05	.04

Note. Gender: male = 1, female = 0

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

Student 1 gender was non-significant, as in the previous model (B_{03} = -.09, SE = .25), t(47) = -.36, p = .72. The effect of Student 2 gender also re-emerged, such that male participants in the Student 2 role reported more negative behaviours from Student 1 than female participants in the Student 2 role (B_{04} = .77, SE = .31), t(47) = 2.53, p = .02.

The main effect of independent self-construal, which was marginally significant in the previous model, dropped to a trend level when fairness environment and its associated effects were added to the model. The direction of the trend suggested that, as before, Student 1 participants with a strong, compared to a weak, independent self-construal were more likely to display negative behaviours overall (B_{05} = .21, SE = .13), t(47) = 1.64, p = .11. The main effect of interdependent self-construal was marginal in the previous model, but became significant in the current model. The direction of this main effect indicated that Student 1 participants with a strong, compared to a weak, interdependent self-construal were less likely to display negative behaviours overall (B_{06} = -.50, SE = .20), t(47) = -2.50, p = .02.

Although the main effect of fairness environment was not significant (B_{07} = .20, SE = .17), t(47) = 1.18, p = .25, there was a significant two-way interaction between independent self-construal and fairness environment (B_{08} = -.57, SE = .12), t(47) = -4.75, p < .001. Recall that a similar two-way interaction emerged in the model with Student 1 fairness behaviour as the criterion variable. This prior interaction showed that, among Student 1 participants with a strong independent self-construal, those who perceived a strong fairness environment in their graduate program behaved more fairly than those who perceived the fairness environment to be weak. A similar effect emerged in the current model, such that Student 1 participants with a strong

independent self-construal engaged in fewer negative behaviours toward Student 2 when they perceived the fairness environment to be strong, rather than weak. The opposite effect also emerged among participants with a weak independent self-construal, such that these individuals engaged in more negative behaviours toward Student 2 when they perceived the fairness environment to be strong, rather than weak.

As in the previous model with Student 1 negative behaviour as the criterion variable, the results of the current model showed a negative overall slope of supervisor treatment on Student 1 negative behaviour (B_{10} = -.23, SE = .08), $t(52)$ = -2.95, p = .005, indicating that Student 1 participants engaged in fewer negative behaviours on days when they experienced more unfair treatment from their supervisor. With the addition of fairness environment and its associated interactions in the current model, the previously non-significant cross-level interaction between Student 1 independent self-construal and supervisor treatment became significant (B_{11} = -.13, SE = .03), $t(52)$ = -3.68, p = .001. A plot of this interaction revealed that the main effect of supervisor treatment on Student 1 negative behaviour toward Student 2 was more pronounced for Student 1 participants with a strong, rather than weak, independent self-construal (see Figure 5). In other words, Student 1 participants with a strong independent self-construal showed a greater decrease in negative behaviours toward Student 2 on days when they were treated unfairly by their supervisor, as compared to participants with a weak independent self-construal.

Although fairness environment was entered in the Level 2 slope equation as a control variable and was not of primary relevance to Hypothesis 9, the cross-level interaction between fairness environment and supervisor treatment was significant (B_{12}

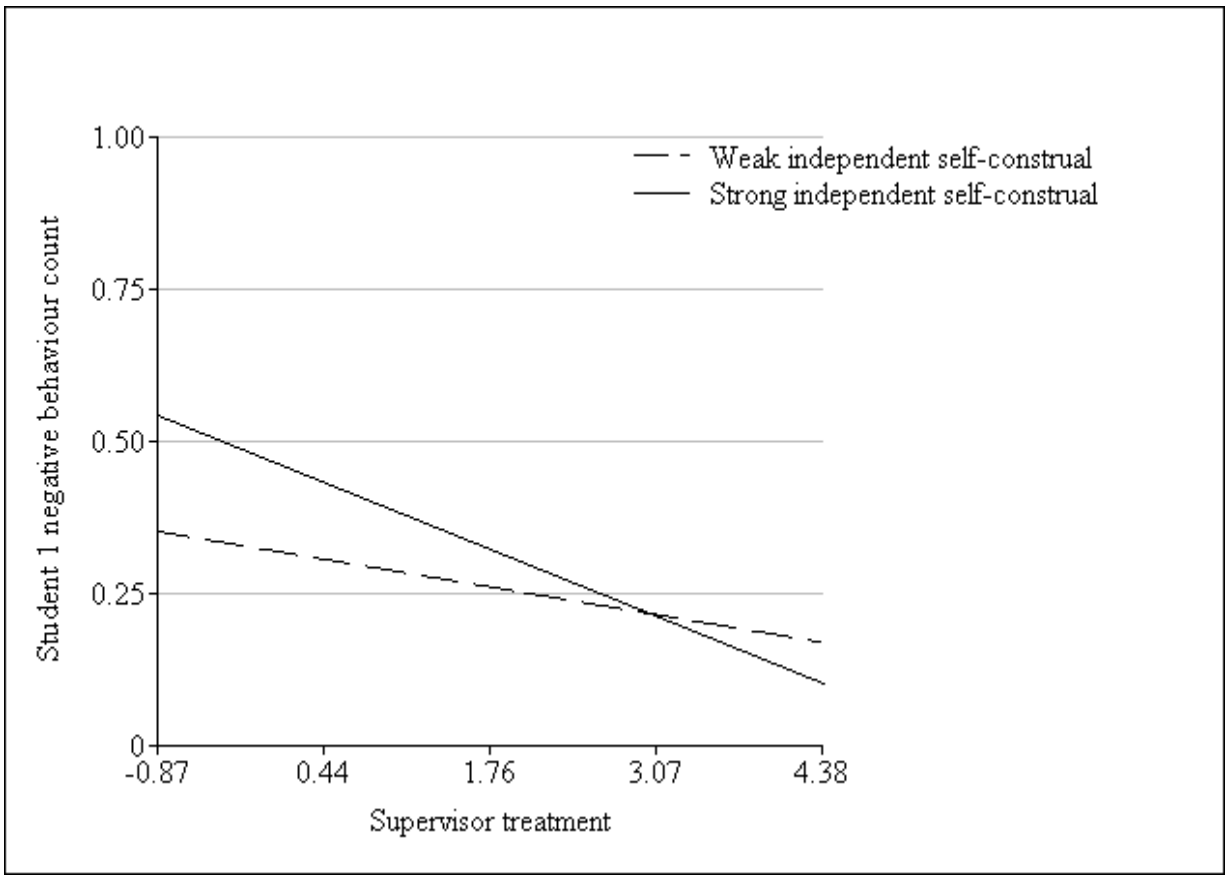

Figure 5. Cross-level interaction of independent self-construal and supervisor treatment[28] predicting Student 1 negative behaviour toward Student 2[29]

[28] As in Figures 3, 4, and 6, supervisor treatment has been group-mean centered. Values on the x-axis represent the full range of the group-mean centered supervisor treatment scale, with lower values indicating fair treatment, and higher values indicating unfair treatment.

[29] In Figure 5, values on the y-axis represent counts of negative behaviours, with lower values indicating fewer negative behaviours and higher values indicating more negative behaviours.

= -.11, *SE* = .06), *t*(52) = -2.00, *p* = .05. The form of this interaction revealed that the main effect of supervisor treatment on Student 1 negative behaviour toward Student 2 was more pronounced among Student 1 participants who perceived a strong, as opposed to weak, fairness environment in their graduate program. Specifically, as compared to Student 1 participants who perceived a weak fairness environment, those who perceived a strong fairness environment in their graduate program showed a larger decrease in negative behaviours on days when they were treated more unfairly by their supervisor.

Counter to Hypothesis 9, the three-way cross-level interaction among independent self-construal, fairness environment, and supervisor treatment was not significant (B_{13} = -.05, *SE* = .04), *t*(52) = -1.27, *p* = .21.

Student 1 Positive Behaviour Count

Hypothesis 7 HLM equations. Hypothesis 7 predicted that participants in the Student 1 role would be more likely to act fairly toward Student 2 on days when they felt more unfairly treated by their supervisor if they had a strong, as compared to weak, interdependent self-construal. This hypothesis was supported in the models with Student 1 fairness behaviour as the criterion variable, and was tested for a second time using Student 1 positive behaviour count as a criterion variable.

The Level 1 equation for this model was:

$$\log (L) = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where L was the number of daily Student 1 positive behaviours, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment, and e was the Level 1 residual variance.

The Level 2 control variables (Student 1 and 2 general attitudes toward each other, and Student 1 and Student 2 gender) were entered as predictors of the Level 1 intercept. In addition to controlling for the main effect of interdependent self-construal, which was of primary interest in Hypothesis 7, independent self-construal was controlled in the Level 1 intercept equation due to the marginal correlation between the two self-construals. To test whether interdependent self-construal moderated the relation between supervisor treatment and Student 1 daily positive behaviour, interdependent self-construal was entered as a predictor of the Level 1 slope.

The results of this model revealed no main effects of Student 1 or Student 2 gender on Student 1 positive behaviour. As a result, Student 1 and Student 2 gender were trimmed from the Level 2 model. Although there were also no main effects of Student 1 and Student 2 general attitudes toward each other in the current model, these two controls were retained to maintain consistency with the other models in which Student 1 and 2 general attitudes exerted significant effects. Thus, the revised Level 2 intercept and slope equations were:

$$P_0 = B_{00} + B_{01} * (\text{Student 1 general attitude}) + B_{02} * (\text{Student 2 general attitude}) + B_{03} * (\text{independent self-construal}) + B_{04} * (\text{interdependent self-construal}) + r_0$$

and

$$P_1 = B_{10} + B_{11} * (\text{interdependent self-construal}) + r_1$$

where B_{00} was the Level 2 intercept, B_{01} - B_{04} were the main effects of variables defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, B_{11} was the cross-level interaction between interdependent self-construal and supervisor treatment, and r_1 was the residual variance in the slope.

Hypothesis 7 findings. The results for the Student 1 positive behaviour model, shown in Table 11, revealed no significant main effects for Student 1 or 2 general attitudes toward each other (B_{01} = .08, *SE* = .10), $t(51) = .81$, $p = .42$, and (B_{02} = -.03, *SE* = .10), $t(51) = -.33$, $p = .74$, and no significant main effects for Student 1 independent and interdependent self-construals (B_{03} = -.04, *SE* = .08), $t(51) = -.55$, $p = .58$, and (B_{04} = .06, *SE* = .13), $t(51) = .45$, $p = .66$, respectively.

Although the average effect of supervisor treatment on Student 1 positive behaviour was not significant (B_{10} = -.04, *SE* = .09), $t(54) = -.49$, $p = .63$, the relation between supervisor treatment and Student 1 daily positive behaviour was found to vary according to Student 1's interdependent self-construal (B_{11} = .36, *SE* = .11), $t(54) = 3.46$, $p = .001$. A plot of this cross-level interaction is shown in Figure 6. Consistent with Hypothesis 7, participants with a strong interdependent self-construal engaged in more positive behaviours toward Student 2 on days when they were treated more unfairly by their supervisor. In addition, the opposite effect was observed among participants with a weak interdependent self-construal, who engaged in fewer positive behaviours toward Student 2 on days when they were treated more unfairly by their supervisor.

Hypothesis 10 HLM equations. Hypothesis 10 predicted that the cross-level interaction between interdependent self-construal and supervisor treatment would be moderated by Student 1's perceptions of the fairness environment, creating a three-way, cross-level interaction. This hypothesis was not supported with Student 1 fairness behaviour as the criterion variable, but was tested for a second time with Student 1 positive behaviour as the criterion variable.

Table 11

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Positive Behaviour as a Function of Interdependent Self-Construal and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*	Event rate ratio
Intercept	B_{00}	1.17***	.08	3.23
Student 1 general attitude	B_{01}	.08	.10	1.09
Student 2 general attitude	B_{02}	-.03	.10	.97
Independent self-construal	B_{05}	-.04	.08	.96
Interdependent self-construal	B_{06}	.06	.13	1.06
Supervisor treatment	B_{10}	-.04	.09	.96
Interdependent self-construal x supervisor treatment	B_{11}	.36**	.11	1.44

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

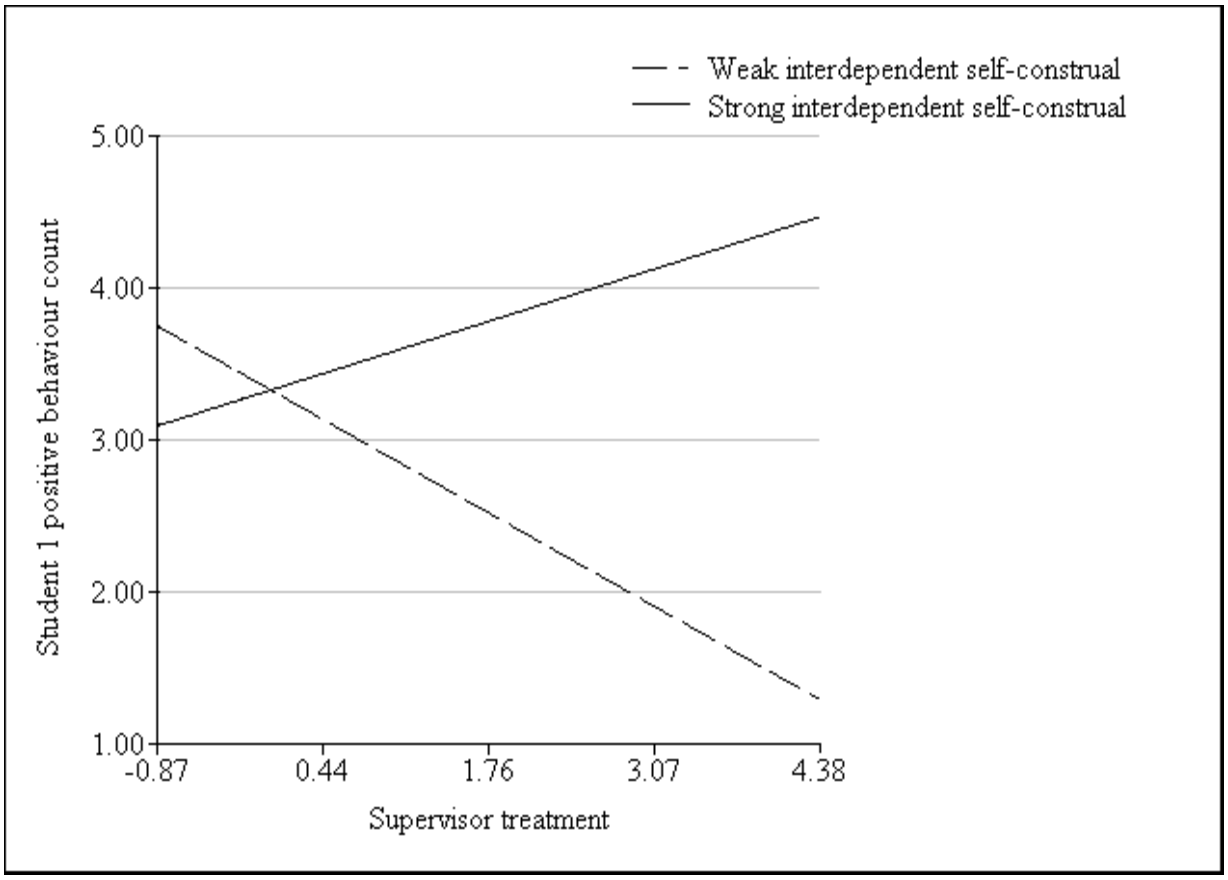

Figure 6. Cross-level interaction of interdependent self-construal and supervisor treatment[30] predicting Student 1 positive behaviour toward Student 2[31]

[30] As in Figures 3, 4, and 5, supervisor treatment has been group-mean centered. Values on the x-axis represent the full range of the group-mean centered supervisor treatment scale, with lower values indicating fair treatment, and higher values indicating unfair treatment.

[31] In Figure 6, values on the y-axis represent counts of positive behaviours, with lower values indicating fewer positive behaviours and higher values indicating more positive behaviours.

The Level 1 model for this analysis was identical to the Level 1 model used to test Hypothesis 7 with positive behaviour count as the criterion variable:

$$\log (L) = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where L was the number of daily Student 1 positive behaviours, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment, and e was the Level 1 residual variance.

At Level 2, Student 1 and 2 general attitudes were once again controlled in the Level 1 intercept equation. Student 1 and Student 2 gender were omitted due to their non-significance in the previous model with Student 1 positive behaviour as the criterion variable. As in previous models, Student 1 independent and interdependent self-construals and perceptions of the fairness environment were also controlled in the Level 1 intercept equation.

To test the three-way cross-level interaction among the interdependent self-construal, fairness environment, and supervisor treatment variables, I controlled for the two-way interaction between interdependent self-construal and fairness environment by entering this interaction as a predictor of the Level 1 intercept. The two-way cross-level interactions of interdependent self-construal and supervisor treatment, and of fairness environment and supervisor treatment, were controlled by adding interdependent self-construal and fairness environment as predictors of the Level 1 slope. Finally, the three-way cross-level interaction was tested by entering the two-way interaction between interdependent self-construal and fairness environment into the Level 1 slope equation. The Level 2 intercept and slope equations were therefore:

$P_0 = B_{00} + B_{01} * (\text{Student 1 general attitude}) + B_{02} * (\text{Student 2 general attitude}) + B_{03} * (\text{independent self-construal}) + B_{04} * (\text{interdependent self-construal}) + B_{05} * (\text{fairness environment}) + B_{06} * (\text{interdependent self-construal x fairness environment}) + r_0$

and

$P_1 = B_{10} + B_{11} * (\text{interdependent self-construal}) + B_{12} * (\text{fairness environment}) + B_{13} * (\text{interdependent self-construal x fairness environment}) + r_1$

where B_{00} was the Level 2 intercept, B_{01} - B_{05} were the main effects of variables defined at Level 2, B_{06} was the two-way interaction between variables defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, B_{11} and B_{12} were the two-way cross-level interactions between variables defined at Level 2 and supervisor treatment (defined at Level 1), B_{13} was the three-way cross-level interaction among interdependent self-construal, fairness environment, and supervisor treatment, and r_1 was the residual variance in the slope.

Hypothesis 10 findings. The results for this model revealed no significant effects for any of the control variables in the intercept equation (see Table 12). Specifically, Student 1 and 2 general attitudes were both non-significant (B_{01} = .07, *SE* = .11), $t(49)$ = .64, p = .53, and (B_{02} = -.03, *SE* = .10), $t(49)$ = -.29, p = .77, as were the main effects of Student 1's independent and interdependent self-construals (B_{03} = -.03, *SE* = .08), $t(49)$ = -.40, p = .69, and (B_{04} = .02, *SE* = .13), $t(49)$ = .13, p = .90, the main effect of fairness environment (B_{05} = .15, *SE* = .11), $t(49)$ = 1.44, p = .16, and the two-way interaction between interdependent self-construal and fairness environment (B_{06} = -.03, *SE* = .12), $t(49)$ = -.29, p = .77.

Table 12

Study 3: Hierarchical Linear Modeling Analysis of Student 1 Positive Behaviour as a Function of Interdependent Self-Construal, Fairness Environment, and Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*	Event rate ratio
Intercept	B_{00}	1.17***	.09	3.24
Student 1 general attitude	B_{01}	.07	.11	1.07
Student 2 general attitude	B_{02}	-.03	.10	.97
Independent self-construal	B_{05}	-.03	.08	.97
Interdependent self-construal	B_{06}	.02	.13	1.02
Fairness environment	B_{07}	.15	.11	1.16
Interdependent self-construal x fairness environment	B_{08}	-.03	.12	.97
Supervisor treatment	B_{10}	-.04	.09	.97
Interdependent self-construal x supervisor unfairness	B_{11}	.38**	.11	1.46
Fairness environment x supervisor unfairness	B_{12}	.06	.12	1.06
Interdependent self-construal x fairness environment x supervisor treatment	B_{13}	.05	.12	1.05

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

As in the previous model, the average slope of supervisor treatment on Student 1 positive behaviour was not significantly different from zero (B_{10} = -.04, *SE* = .09), $t(52) = -.39$, $p = .70$, but was found to vary according to Student 1 interdependent self-construal (B_{11} = .38, *SE* = .11), $t(52) = 3.38$, $p = .002$. This slope was not moderated by Student 1 perceptions of the fairness environment (B_{12} = .06, *SE* = .12), $t(52) = .51$, $p = .61$.

The results for the three-way cross level interaction revealed that Student 1 perceptions of the fairness environment did not moderate the cross-level interaction between interdependent self-construal and supervisor treatment (B_{13} = .05, *SE* = .12), $t(52) = .43$, $p = .67$. Therefore, Hypothesis 10 was not supported.

Daily Program-based Self-esteem

Hypothesis 8 HLM equations. Hypothesis 8 predicted that Student 1 would report lower daily program-based self-esteem on days when they experienced more, rather than less, unfair treatment from their supervisor, controlling for baseline program-based self-esteem. To test this hypothesis, a linear model was constructed in which program-based self-esteem was specified as the outcome variable, and supervisor treatment was entered as a Level 1 predictor:

$$Y = P_0 + P_1 * (\text{supervisor treatment}) + e$$

where Y was Student 1 daily program-based self-esteem, P_0 was the Level 1 intercept, P_1 was the effect of supervisor treatment on Y, and e was the Level 1 residual variance.

Because both the predictor and criterion variables in this analysis were provided by Student 1, controlling for Student 2 gender and Student 1 and 2 general attitudes toward one another seemed unnecessary. Therefore, the Level 2 control variables

entered as predictors of the Level 1 intercept were Student 1 gender and Student 1 baseline program-based self-esteem. The effect of Student 1 gender proved to be non-significant, and was subsequently trimmed from the model. The Level 2 equations for the revised model were:

$$P_0 = B_{00} + B_{01} * (\text{baseline program-based self-esteem}) + r_0$$

and

$$P_1 = B_{10} + r_1$$

where B_{00} was the Level 2 intercept, B_{01} was the main effect of baseline program-based self-esteem defined at Level 2, r_0 was the residual variance in the intercept, B_{10} was the average slope of supervisor treatment, and r_1 was the residual variance in the slope.

Hypothesis 8 findings. The results for this model are shown in Table 13. There was a significant main effect of baseline program-based self-esteem (B_{01} = .59, SE = .10), $t(54) = 6.08$, $p < .001$, such that participants with higher baseline program-based self-esteem also showed higher levels of daily program-based self-esteem. In addition, the relation between daily supervisor treatment and daily program-based self-esteem was significant and negative (B_{10} = -.22, SE = .07), $t(55) = -3.34$, $p = .002$, indicating that participants in the Student 1 role reported lower daily program-based self-esteem on days when they were treated more unfairly by their supervisor. These results supported Hypothesis 8.

Exploratory Qualitative Data

At the end of each daily survey, Student 1 was given the opportunity to describe any unfair treatment they received from their supervisor that day. A total of 23 descriptions were provided from 10 different participants (17% of the sample).

Table 13

Study 3: Hierarchical Linear Modeling Analysis of Program-Based Self-Esteem as a Function of Supervisor Treatment

Description of effect	Coefficient name	Coefficient estimate	*SE*
Intercept	B_{00}	5.29***	.10
Baseline program-based self-esteem	B_{01}	.59***	.10
Supervisor treatment	B_{10}	-.22**	.07

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

Unfortunately, the relatively small number of qualitative responses provided by participants precluded the possibility of conducting any post-hoc statistical content analyses on these data; therefore, a primarily descriptive examination of participants' responses was performed instead. I categorized the qualitative responses according to whether they violated principles of distributive, procedural, informational, interpersonal fairness, or a combination of these. Of the 20 responses that were classified as falling primarily into one category, 15% were classified as being violations of distributive justice, 15% were violations of procedural justice, 35% were violations of informational justice, and 35% were violations of interpersonal justice. Two additional responses described a combination of distributive and interpersonal violations, and one described a combination of distributive and informational violations. For a list of participants' qualitative responses and how they were classified, see Appendix N.

Discussion

The primary goal of Study 3 was to replicate the results of Studies 1 and 2 in a field setting. Although the Study 3 findings for interdependent self-construal were consistent with the results of Study 1, the Study 1 and 2 findings for independent self-construal were not replicated in Study 3.

Independent Self-Construal x Supervisor Treatment

Hypothesis 6 predicted that Student 1 participants with a strong, rather than weak, independent self-construal would be more likely to act unfairly toward Student 2 on days when they felt more unfairly treated by their supervisor. This hypothesis was tested twice using Student 1 fairness behaviour and Student 1 negative behaviour as criterion variables. The results for the fairness behaviour criterion variable showed that contrary to predictions, participants with a strong independent self-construal were not more unfair toward Student 2 on days when they were treated more unfairly by their supervisor. Rather, participants with a *weak* independent self-construal became *fairer* toward Student 2 on days when they were treated more unfairly by their supervisor.

The results for the negative behaviour criterion variable were also contrary to predictions. Independent self-construal did not initially interact with supervisor treatment to predict negative behaviour toward Student 2; however, this interaction became significant after controlling for the effects of Student 1's perceptions of the fairness environment in their graduate program. The form of the interaction showed that the overall trend for Student 1 participants to engage in *fewer* negative behaviours toward Student 2 on days when they felt more unfairly treated by their supervisor was

more pronounced among participants with a *strong*, compared to weak, independent self-construal.

Although there are many factors that set Study 3 apart from Studies 1 and 2, a major difference that may account for the discrepant independent self-construal findings is the nature of the criterion variables used Study 3 as compared to the two laboratory studies. After experiencing unfair treatment from an authority, participants in Studies 1 and 2 remained confined to the laboratory where they were presented with a finite set of behavioural options for restoring their damaged self-esteem. Participants' choices among these options were then used as the dependent variables in Studies 1 and 2. By contrast, Study 3 was conducted in a field setting where behavioural options for restoring one's self-esteem are far more numerous. As such, participants who were treated unfairly by their supervisors may have engaged in a wide array of behaviours—some directed toward fellow graduate students and others not—in an attempt to restore their self-esteem.

Indeed, as mentioned previously, individuals who encounter a threat to their self-esteem have been found to engage in a wide variety of behaviours ranging from derogating innocent others (Fein & Spencer, 1997) to withdrawing from social interactions (Folger & Skarlicki, 1998). Although the fairness behaviour scale and negative behaviour count questionnaire were constructed to assess a wide range of behaviours that could be perceived as being related to unfairness, it is possible that these measures were too broad in scope. Alternatively, the measures may have been focused on the wrong behaviours. As a result, the daily surveys may not have properly

assessed some important unfairness-related behaviours occurring either at school or outside of school on a regular basis.

In hindsight, the criterion variables used in Study 3 focused on various specific and general types behaviour directed at fellow students, but did not assess withdrawal behaviour. Graduate students generally have a great deal of autonomy and are often allowed to work their own hours, coming and going as they please. As a result, withdrawing from social interaction by leaving campus or working at the library for the day may be a viable option for graduate students who feel unfairly treated by their supervisor. In more structured workplaces, however, social withdrawal by managers has been linked to unfairness perceptions among employees (Folger & Skarlicki, 1998; Wiesenfeld et al., 2000). It seems likely that social withdrawal by an employee, especially in situations where co-workers depend on one another to get their jobs done, may bring about similar perceptions of unfairness among the employee's co-workers. Therefore, assessing withdrawal behaviours in conjunction with other potentially unfairness-related behaviours may be an important consideration in future research on this topic.

The notion that withdrawal may have been a common reaction among graduate students is supported by the Study 3 finding that Student 1's negative behaviour count actually decreased on days when they experienced more unfair treatment from their supervisor, as compared to days when they experienced less unfair treatment. Clearly, graduate students who withdrew from interactions with their peers would not have generated a high negative behaviour count, as assessed by this criterion variable in its current form. Although this decrease was a main effect observed across all participants

in the Student 1 role, the results of the model including the effects of fairness environment suggest that the decrease was more pronounced among participants with a strong, rather than weak, independent self-construal, as well as among participants who perceived a strong, rather than weak, fairness environment in their graduate program. In the current study, it is impossible to know whether independent self-construal and perceptions of the fairness environment would have interacted with supervisor treatment to influence withdrawal, as withdrawal behaviours were not actually measured. However, the current results are consistent with the notion that participants with a strong independent self-construal may be more likely withdraw from social interactions than participants with a weak independent self-construal. They also suggest that students who believe their graduate program is a fair place may be more likely to withdraw after experiencing unfair treatment from their supervisor than students who perceive less fairness in their graduate program overall.

An additional limitation associated with the Study 3 criterion variables was the restricted range of responses observed on the Student 1 fairness behaviour scale. As can be seen in Table 5, the vast majority of Student 2 responses on this criterion variable were in the "fair" range (M = 1.60, SD = .89). Although this was probably due in part to a low base rate of unfairness enacted toward Student 2 by Student 1, it is also possible that some participants in the Student 2 role were reluctant to blatantly label their colleague's actions as "unfair." The latter explanation is supported by the fact that, on average, Student 2 reported one negative, potentially unfairness-related behaviour from Student 1 every other day as assessed by the negative behaviour count scale (M = .55, SD = 1.40).

Interdependent Self-Construal x Supervisor treatment

In contrast to the disappointing findings for independent self-construal, the results for interdependent self-construal in Study 3 were as predicted and consistent with Study 1. Specifically, Hypothesis 7 predicted that that Student 1 participants with a strong, rather than weak, interdependent self-construal would be more likely to act fairly toward Student 2 on days when they felt more unfairly treated by their supervisor. As with independent self-construal, this effect of interdependent self-construal was tested twice using Student 1 fairness behaviour and Student 1 positive behaviour as criterion variables. In both cases, Hypothesis 7 was supported. Student 1 participants with a strong interdependent self-construal were rated by Student 2 as being fairer on days when they were treated more unfairly by their supervisor, and also were reported as engaging in more positive behaviours toward Student 2 on days when they were treated more unfairly by their supervisor. Although no predictions were made for participants with a weak interdependent self-construal, the results showed the opposite effect for these students, who engaged in fewer positive behaviours toward Student 2 on days when they were treated unfairly by their supervisor.

Program-Based Self-Esteem

In addition to examining the interactive effects of independent and interdependent self-construals and supervisor treatment on graduate students' behaviour toward their colleagues, Study 3 re-examined the validity of the assumption that self-esteem may be a potential mechanism underlying these effects. Recall that in Study 1, I examined participants' state self-esteem at three points in time: 1) baseline, 2) after experiencing unfair treatment from an authority, and 3) after acting unfairly, fairly, or

altruistically toward a group member. Unfortunately, such precise measurements of fluctuations in state self-esteem were not feasible in Study 3. Although program-based self-esteem was assessed during the pre-study survey to provide a baseline measure, the daily survey format in Study 3 allowed for only one measurement of program-based self-esteem per day.

As mentioned previously, both Student 1 and Student 2 were asked to complete the daily surveys at the end of the day to increase the number of interactions between Student 1 and their supervisor, as well as between Student 1 and 2, prior to survey completion. Admittedly, this arrangement was optimal for collecting data on the fairness behaviour and behaviour count criterion variables but suboptimal for the assessment of program-based self-esteem. Specifically, this arrangement gave participants in the Student 1 role who did experience unfairness from their supervisor a greater opportunity to restore their damaged self-esteem by interacting with fellow graduate students prior to completing the daily survey. However, these interactions were necessary for participants in the Student 2 role to be able to report on any unfair or fair treatment they received from Student 1. Thus, it seems likely that by the time they completed the daily survey, many Student 1 participants who had been treated unfairly by their supervisor would have already restored their damaged self-esteem.

Recognizing this fact, the daily instructions for the program-based self-esteem questionnaire asked participants to think about their experiences in their graduate program that day, and to take these experiences into consideration when responding to the program-based self-esteem items. Prior research has shown that the experience of unfairness is often a significant and emotional event that creates strong memories (e.g.,

Bies, 1987; Mikula et al., 1998). Not surprisingly, however, people's retrospective reports about emotional experiences are most accurate when the events upon which they are based are still recent, and when the number of emotional events they are asked to consider (i.e., integrate) in their response is small (Robinson & Clore, 2002).

Given that participants in Study 3 were being asked to recall only those events that had occurred within the same day, I was confident that participants would be able to provide accurate reports on their self-evaluations associated with these events. In addition, I reasoned that prompting participants to think about the significant events in their day would trigger memories of any unfair treatment that had occurred, increasing the chances that their reports of program-based self-esteem would be based this experience of unfairness. To further increase the salience of significant daily events, the instructions stressed a daily timeframe and asked participants to report on their program-based self-esteem "today," rather than, for example, "right now."

The results for the Study 3 self-esteem analyses showed that, as predicted in Hypothesis 8, participants reported lower daily program-based self-esteem on days when they experienced more unfair treatment from their supervisor compared to days when they experienced less unfair treatment. This effect was over and above the effect of baseline program-based self-esteem, which was also a significant predictor of daily program-based self-esteem. These findings are consistent with the results of Study 1, which also showed a drop in participants' state self-esteem following unfair treatment from an authority.

Compared to Study 1, a clear limitation of the Study 3 self-esteem findings is that they cannot speak to the question of whether participants were able to restore their

damaged self-esteem by behaving unfairly or fairly toward fellow graduate students. (Recall that in Study 1, the results were consistent with the notion that participants were able to recover their state self-esteem by acting unfairly, fairly, or altruistically toward a fellow group member.) Despite this limitation, the Study 3 findings revealed a significant drop in daily program-based self-esteem associated unfair treatment from a supervisor. This association could not be definitively shown in Study 1, due to the lack of a control condition. Therefore, when examined together, it seems that the results of Studies 1 and 3 represent separate, but complimentary, pieces of the self-esteem puzzle.

Fairness Environment

An additional aim of Study 3 was to determine whether Student 1's perceptions of the fairness environment in their graduate program moderated the interactive effects of Student 1's independent and interdependent self-construals and supervisor treatment on unfair and fair behaviour toward fellow graduate students. Contrary to Hypothesis 9, there was no significant effect of the three-way interaction among independent self-construal, fairness environment, and supervisor treatment on the fairness behaviour and negative behaviour criterion variables. Also contrary to Hypothesis 10, Student 1's perceptions of the fairness environment failed to moderate the interaction between interdependent self-construal and supervisor treatment on the fairness behaviour and positive behaviour count criterion variables.

A note of caution regarding the Study 3 sample size should be made prior to drawing any firm conclusions from these null findings for Hypotheses 9 and 10. In HLM, the Level 2 sample size has a greater effect on the stability of an interaction than the Level 1 sample size. In Study 3, the Level 2 sample comprised 56 pairs of

participants who were included in the final analyses. Current recommendations suggest that at least 50 Level 2 cases are needed to ensure that Level 2 effects are unbiased (Maas & Hox, 2001). Although the Study 3 sample meets this criterion, testing three-way interactions in HLM may require a significantly larger Level 2 sample size than 56. According to Bickel (2007), the recommended Level 2 sample sizes for testing two-way and three-way interactions in HLM are similar to the conventions used for testing interactions in regular multiple regression. As such, a much larger sample size would have been preferable for testing the three-way interactions proposed in Study 3. Taken together, these recommendations suggest that more confidence should be placed in the findings for the two-way interactions tested in Hypotheses 6 and 7 than in the findings for the three-way interactions tested in Hypotheses 9 and 10.

Three-way interactions aside, it should also be noted that there were no main effects of fairness environment on any of the criterion variables. In addition, the unpredicted effects of independent self-construal on fairness behaviour, as well as the predicted effects of interdependent self-construal on fairness behaviour and positive behaviour, remained significant when fairness environment and its associated interactions were added to each of the models. Within the limitations of the current sample size, the Study 3 results suggest that graduate students with a strong interdependent or weak independent self-construal act most fairly toward their colleagues on days when they are treated unfairly by their supervisor, regardless of how fairly they think other members of their graduate program act on a daily basis. The results also suggest that students with a weak interdependent self-construal may act less

fairly toward other graduate students on days when they are treated unfairly by their supervisor, regardless of the fairness environment in their graduate program.

Gender

Consistent with Study 2, there were no effects of Student 1 gender on any of the criterion variables in any of the models tested in Study 3. There was, however, a significant effect of Student 2 gender in both models predicting Student 1 negative behaviour. This effect showed that, controlling for Student 1's gender, male participants in the Student 2 role were more likely than females to report daily negative behaviours from Student 1. There may be a number of potential explanations for this effect.

First, it is possible that male participants were simply more honest than female participants when it came to reporting negative behaviours directed toward them by Student 1. Indeed, personality researchers have found that women score higher than men on the Big Five trait of agreeableness (Budaev, 1999; Costa, Terracciano, & McCrae, 2001). This suggests that, in the current study, women in the Student 2 role may have been more likely than men to distort their responses to create a more favourable impression of Student 1. However, research on response biases has found no consistent differences between men and women in their tendencies to engage in extreme, acquiescent, or socially desirable response styles (e.g., Grimm & Church, 1999; Hamilton, 1968; Marin, Gamba, & Marin, 1992). Given the lack of support in the literature for gender differences in response biases, it seems unlikely that social desirability or any other response bias would explain the gender difference observed on the negative behaviour criterion variable.

A second explanation for this gender difference may be that male and female participants in the Student 2 role perceived Student 1's behaviour differently. Indeed, the fairness literature suggests that there are consistent gender differences in perceptions of, and reactions to, unfairness. For example, research has shown that men are more strongly influenced by distributive justice, whereas women are more strongly influenced by procedural justice (Major & Deaux, 1982; Sweeney & McFarlin, 1997). In addition, men may react more negatively than women after experiencing distributive injustice from a peer (Major & Deaux, 1982). Despite the more well-established findings for distributive and procedural justice, very little published research has examined gender differences in perceptions of interpersonal and informational justice. Because the fairness rating and negative behaviour scales used in Study 3 assessed primarily interpersonal and informational aspects of unfairness, it is difficult to draw any inferences from the existing literature to explain the current gender finding. However, given that interpersonal and informational justice are often viewed as having more in common with procedural justice than distributive justice (see Bobocel & Holmvall, 2001), it seems that females should be more sensitive to violations of interpersonal and informational justice, as compared to males. This prediction is, unfortunately, counter to the gender finding that emerged in Study 3.

A third explanation for the gender finding may be that Student 1 participants of both genders engaged in more negative behaviours directed toward Student 2 when Student 2 was male, as compared to when Student 2 was female. Of the three explanations described here, this one would seem to have the most theoretical implications for the current research. Specifically, it may be that individuals who are

treated unfairly by an authority are more likely to act negatively or unfairly toward a group member who is male rather than female. To further examine this possibility, I re-ran the regression analyses for Studies 1 and 2 including participant gender as well as the gender of the participant's laboratory partner as predictors. The results of these two revised models revealed no significant effects of either gender variable on participants' assignment decisions, aside from the previously reported main effect of participant gender in Study 1. In addition, the results for all other variables remained almost identical to the previously reported results for both Study 1 and Study 2. Given these findings, it seems unlikely that the standalone effect of Student 2 gender in Study 3 is of any real theoretical importance to the current research.

Student 1 and Student 2 General Attitudes

Across several models, the Study 3 results showed significant main effects for Student 1 and Student 2 general attitudes toward one another. In general, these results revealed that Student 2 participants who indicated a stronger liking for Student 1 in the pre-study survey were less likely to rate Student 1 as being unfair, and were less likely to report negative behaviours by Student 1. This is not surprising, given that graduate students—as well as other employees—often form close friendships with their colleagues, potentially causing them to ignore or overlook some behaviours that may otherwise be seen as negative or unfair. In addition, colleagues who consider the offender to be a close friend may be less inclined to report any negative or unfair behaviour that they do notice.

The results also showed that, controlling for Student 2's liking of Student 1, Student 1 participants who indicated a stronger liking for Student 2 were more likely to

be rated as acting unfairly and engaging in negative behaviours directed toward Student 2. Although these findings may seem counterintuitive at first glance, it follows that graduate students in our study, as well as employees in general, may be more comfortable expressing negative emotions and behaviours around those whom they consider to be close friends. Taken together, these findings for Student 1 and Student 2's general attitudes toward each other suggest that individuals who experience unfair treatment from an authority may be most likely to vent their frustrations with colleagues whom they like, rather than dislike. However, the likelihood that colleagues will report these behaviours as unfair or negative appears to depend on whether or not the feelings of friendship are reciprocated.

Main Effects of Independent and Interdependent Self-Construals

No main effects of Student 1's independent or interdependent self-construals were predicted in Study 3. However, some main effects of these variables emerged in the two models testing Student 1 negative behaviour toward Student 2 as the criterion variable. In the initial model testing Student 1 negative behaviour, participants in the Student 1 role with a strong independent self-construal were marginally more likely to display negative behaviours toward Student 2 overall, as compared to those with a weak independent self-construal. This main effect dropped to a trend level when the effects of fairness environment were included as predictors of negative behaviour. The initial model also showed a marginal main effect of interdependent self-construal, such that Student 1 participants with a strong, as opposed to weak, interdependent self-construal were less likely to engage in negative behaviours directed toward Student 2. This main effect became significant when fairness environment was included in the model.

The main effect of independent self-construal can be explained by the general tendency among individuals with a strong independent self-construal to base their behaviour on their own goals rather than the group's goals (Markus & Kitayama, 1991; Triandis, 1995; Triandis et al., 1986; Triandis et al., 1988). It follows that individuals with a strong independent self-construal may be more likely to engage in negative and potentially unfair interpersonal behaviours when they perceive that these behaviours will help them achieve their own goals, regardless of the impact on others. In contrast, the main effect of interdependent self-construal on mean levels of negative behaviours may be due to the efforts made by individuals with a strong interdependent self-construal to maintain harmonious social relationships with others (Markus & Kitayama, 1991; Triandis, 1995; Triandis et al., 1986; Triandis et al., 1988). These results suggest that one way to achieve harmony may be to avoid engaging in negative and potentially unfair behaviours directed toward one's colleagues.

Independent Self-Construal x Fairness Environment

Another effect that emerged during the Study 3 analyses was a two-way interaction between Student 1's independent self-construal and their perceptions of the fairness environment in their graduate program. In the models predicting Student 1 fairness behaviour and negative behaviour, participants with a strong independent self-construal acted less fairly/more negatively when they perceived a weak fairness environment, and more fairly/less negatively when they perceived a strong fairness environment. These results suggest that individuals with a strong independent self-construal may be most likely to act fairly when the fairness norms demand such behaviour. However, consistent with the notion that individuals with a strong

independent self-construal prefer to act in accordance with own desires rather than the preferences of others (Markus & Kitayama, 1991; Triandis, 1995; Triandis et al., 1986; Triandis et al., 1988), these individuals may take advantage of the opportunity to act unfairly when fairness norms are lower.

Qualitative Data

As mentioned previously, being treated unfairly is often a highly emotional, upsetting experience that victims remember for a long time (Bies, 1987; Mikula et al., 1998). Of the 307 daily observations included in the Study 3 analyses, participants in the Student 1 role provided a description of unfair treatment by their supervisor in 7.5% of these observations. Unfortunately, it is impossible to know how many more instances may have gone unreported. Considering that the base rate of unfair events actually described in the current study translates to the average graduate student being treated unfairly by their supervisor once every 13-14 school days[32], it would seem that unfair treatment of graduate students by their supervisors is a real problem. In addition, a relatively large proportion of the unfair events reported by graduate students involved interactional (informational or interpersonal) injustice. These findings replicate Bies and Moag's (1986) observation that individuals highly value—but too often may not receive—polite, respectful treatment, as well as timely communications from authorities.

[32] 7.5% corresponds to 7.5 days out of 100, which corresponds to 1 out of 13.3 days.

General Discussion

In the current research, I set out to examine whether individuals' past experiences with unfairness from group authorities interacts with individual differences in independent and interdependent self-construals to predict unfair and fair behaviour toward innocent group members. Across three studies, I found support for these ideas. Specifically, the results of two laboratory studies showed that individuals with a stronger independent self-construal were more likely to behave unfairly toward a fellow group member after being treated unfairly by an authority than individuals with a weaker independent self-construal. In addition, the results of one laboratory study and a field study showed that individuals with a stronger interdependent self-construal were more likely to behave fairly or altruistically toward a fellow group member after being treated unfairly by an authority than individuals with a weaker interdependent self-construal. Despite some inconsistencies across the results of the three studies, the present research shows some support for the notion that when people experience unfair treatment from an authority, the unfairness or fairness of their subsequent interactions with fellow group members can be predicted by their levels of independent and interdependent self-construal, respectively.

A secondary goal of this research was to begin to shed light on *why* individuals with a stronger independent self-construal may act more unfairly, and individuals with a stronger interdependent self-construal more fairly, or at times altruistically, following unfair treatment from an authority. The results of the current research showed that in the laboratory and in the field, participants' self-esteem dropped following unfair treatment from an authority. The results of the laboratory study also suggested that

participants' self-esteem may have recovered after they were given a chance to act unfairly, fairly, or altruistically toward a fellow group member. Together, these findings are consistent with the notion that individuals with a stronger independent self-construal may use unfair behaviours directed toward group members as a way to restore their self-esteem, whereas individuals with a stronger interdependent self-construal may use fair, or even altruistic, behaviours to achieve the same end.

Strengths and Limitations of the Current Research

In an effort to reduce methodological artifacts, I used a variety of methods and measures in the current studies to test my research questions. After examining the interactive effects of participants' self-construals and unfairness from an authority on group-directed unfair and fair behaviour in a laboratory setting, I investigated the generalizability of these findings using a field sample. Although the design of the field study was non-experimental, third-party ratings of the primary criterion variables were obtained to protect against common-method variance.

In addition, the nature of the unfair treatment that participants received varied across all three studies. Study 1 participants received an unfair evaluation from an experimenter whom they had just met, whereas Study 2 participants received a similar unfair evaluation accompanied by an unfair verbal explanation from the experimenter. In contrast to the manipulations of unfair treatment used in the laboratory, Study 3 participants experienced a wide range of unfair events at the hands of their faculty supervisors in a real-world setting.

The measures used to assess participants' unfair behaviours toward fellow group members also varied among the studies. Participants in the two laboratory experiments

were asked to make a forced-choice decision that would affect how much money they and their partner would receive (Study 1), or the length of time that they and their partner would spend in the laboratory (Study 2). In Study 3, participants' unfair and fair behaviours toward fellow graduate students were assessed using a rating scale and a behaviour count.

An obvious limitation of the current research—perhaps related to the use of different methods and measures—is the lack of consistency among the findings from study to study. In Studies 1 and 2, the effects of independent self-construal on unfair behaviour toward a fellow group member were in line with predictions. The results of Study 3, however, did not follow this pattern. Rather than conflicting with predictions for independent self-construal, the results for the fairness rating criterion variable showed an unexpected effect among participants with a weak independent self-construal. Specifically, these participants behaved similar to participants with a strong interdependent self-construal by acting more fairly after experiencing unfairness from their supervisor. No such findings emerged with the negative behaviour count criterion variable; rather, the results for independent self-construal were altogether non-significant. Therefore, it appears that although the predictions for independent self-construal were not borne out in Study 3, none of the findings actually challenged the results of Studies 1 and 2. As discussed previously, given that participants in Study 3 had a great deal of behavioural freedom, a measure of withdrawal behaviours might have revealed the predicted effects for independent self-construal in Study 3.

The results for interdependent self-construal were similarly inconsistent. Although the results of Studies 1 and 3 showed the predicted effects for interdependent

self-construal, no significant findings for interdependent self-construal emerged in Study 2. Given the many similarities between the laboratory paradigms used Studies 1 and 2, it appears that a change in the nature of the dependent variable in Study 2 may have led to the non-significant results. Although a theoretical rationale for why the Study 1 and Study 2 dependent variables might have been perceived differently by individuals with a strong interdependent self-construal is lacking, it is encouraging to note that the Study 1 findings for interdependent self-construal were replicated in a field setting where participants had many behavioural options—rather than just three—for restoring their self-esteem following unfair treatment from an authority.

A second limitation of the current research was the inability to directly test self-esteem as a mediator of the interactive effects of prior unfair treatment by an authority and participants' self-construals on unfair and fair behaviours toward fellow group members. In Study 1, the lack of a control condition prevented me from definitively testing the relation between unfair treatment from an authority and self-esteem. This question was addressed in Study 3 by the finding that self-esteem decreased only for participants who experienced unfair treatment from their faculty supervisor. However, because self-esteem was measured once daily in Study 3, I was unable to observe the process of self-esteem restoration that is believed to occur after participants engage in unfair or fair behaviour directed toward their colleagues.

Future research could address this limitation by having participants complete a short survey following each interaction with an authority or colleague throughout the day. Participants would be asked to provide information about the nature of the interaction, including who the interaction partner was (an authority or colleague), how

they were treated during the interaction, as well as their sate self-esteem following the interaction. Although such a complex design was beyond the scope of the current dissertation, the results of a study of this nature would provide a more detailed picture of whether self-esteem decreases following unfair treatment from authorities and recovers following unfair or fair behaviour enacted toward colleagues.

An additional limitation of the self-esteem findings in Study 3 may be common method variance. Although I was able to protect against common method variance in the primary criterion variables using third-party ratings, measures of supervisor treatment and daily program-based self-esteem were both provided by Student 1 in the same daily survey. While it is impossible to rule out the impact of common method variance based on the Study 3 findings alone, a similar decrease in self-esteem following unfair treatment was observed in Study 1. Because unfair treatment was actually delivered to—rather than rated by—participants in Study 1, the similarity of the Study 1 and 3 findings may help to allay concerns about common method variance in Study 3.

Theoretical Implications

As discussed earlier, contemporary models of fairness (Lind & Tyler, 1988; Tyler, Degoey, & Smith, 1996; Tyler & Lind, 1992) suggest that an important consequence of unfairness lies in its negative impact on recipients' sense of self-worth. The results of the current studies, along with recent research conducted by Bobocel and Zdaniuk (2009; Zdaniuk & Bobocel, 2009), suggest that individuals who experience unfair treatment are motivated to behave in ways that restore their damaged self-esteem. Taken together, this line of research indicates that the *types* of behaviours that

individuals engage in to restore their self-esteem may differ depending on the individual's levels of independent and interdependent self-construal.

After experiencing unfair treatment from a peer, individuals with a strong independent self-construal have been shown to be more likely to engage in revenge than individuals with a weak independent self-construal (Zdaniuk & Bobocel, 2009). In contrast, individuals with a strong interdependent self-construal may be more likely to forgive a peer who has treated them unfairly than individuals with a weak interdependent self-construal (Bobocel & Zdaniuk, 2009). In the current research, I examined situations where the perpetrator of the unfairness was an authority, rather than a peer.

I argued that individuals who experience unfair treatment from an authority may perceive engaging in revenge against the authority as being too risky. Authorities, by definition, are in a position of control, and may use this control to punish those who are caught in acts of revenge. Engaging in acts of forgiveness may also be difficult, especially if contact with the authority is limited. In addition, overt acts of forgiveness may appear suspicious or inappropriate by drawing further attention to an injustice that the authority has been perceived to commit, but doesn't acknowledge. I proposed that in these types of situations, individuals with a strong independent self-construal who experience unfair treatment from an authority may be likely to engage in acts of unfairness toward fellow group members as a way to restore their damaged self esteem. In addition, I proposed that individuals with a strong interdependent self-construal may be likely to engage in acts of fairness toward fellow group members to restore their self-esteem. Although I did not assess revenge and forgiveness toward authorities in

any of my studies, the current results lend some support to my hypotheses. Overall, these findings suggest that when the perpetrator is an authority, individuals may engage in unfair or fair actions toward colleagues as a way to restore their sense of self-worth.

The current studies primarily speak to the impact of either a strong independent *or* a strong interdependent self-construal on behaviour following the experience of unfairness from an authority. An interesting question for future research would be to examine impact of various combinations of the two self-construal strengths on an individual's behaviours. Research supports the notion that individuals possess both an independent and interdependent self-construal, and that the relative strengths of the two construals may vary according to cultural experiences as well as situational factors, such as priming (Gardner et al., 1999; Singelis, 1994; Trafimow et al., 1991; Triandis, 2001). It seems reasonable that the behaviour of individuals with relatively strong levels of both self-construals may be determined by situational factors that prime one self-construal over another, while the behaviour of individuals in whom one self-construal is clearly stronger may be driven by their dominant self-construal in the absence of a strong prime. However, there is very little theory or research upon which to base predictions about the behaviour of individuals in whom both construals are relatively weak. Unfortunately, a very large sample size would also be needed to group individuals according to the various combinations of the two self-construals.

Drawing on the results of the current studies, some observations can be made about the behaviour of individuals in whom one (but not both, given the small sample sizes) self-construal is weak. Reinterpreting the results of Studies 1 and 2, I did find that individuals with a weak independent self-construal were less likely to act unfairly

(and hence more likely to act fairly or altruistically) toward a group member following unfair treatment from an authority, compared to those with a strong independent self-construal. This finding was also replicated in Study 3, where individuals with a weak independent self-construal were more likely to act fairly toward fellow graduate students after experiencing unfair treatment from their faculty supervisor than those with a strong independent self-construal. (In the latter case, however, there were no effects in the opposite direction suggesting that individuals with a strong independent self-construal were more likely to act unfairly than those with a weak independent self-construal).

In Study 1, I also found that individuals with a weak interdependent self-construal were less likely to act fairly or altruistically (and hence more likely to act unfairly) toward a group member following unfair treatment from an authority, compared to those with a strong interdependent self-construal. The results of Study 3 showed that individuals with a weak interdependent self-construal were less likely to engage in positive behaviours related to fairness and altruism directed toward fellow graduate students following unfair treatment from their supervisor, as compared to those with a strong interdependent self-construal.

Although the above findings from Studies 1 and 2 are in line with predictions, they are really only of interest because they represent the opposite poles of high independent and high interdependent self-construals. That is, no predictions were made about *why* individuals with a weaker independent self-construal might act more fairly, or about *why* individuals with a weaker interdependent self-construal might act more unfairly, following unfair treatment from an authority. Similarly, the findings that

emerged in Study 3 concerning participants with a weak independent or interdependent self-construal were unexpected because no predictions were made about the impact that lower levels of these self-construals might have on the behaviours of interest. As mentioned previously, the impact of a weak independent or interdependent self-construal on behaviour may be quite insignificant if the other self-construal is relatively strong, making the stronger self-construal the primary predictor of behaviour. However, the situation is much more interesting when both self-construals are relatively weak.

I would suggest that for individuals in whom both self-construals are relatively weak, feelings of self-esteem are based neither on being a unique individual and asserting the self (as they are for individuals with a strong independent self-construal), nor on maintaining harmonious relationships with others (as they are for individuals with a strong interdependent self-construal). The key to understanding the behaviour of these "low-low" individuals may be to assess what sorts of activities or identities provide these people with their self-esteem. It may in fact be the case that "low-low" individuals base their self-esteem on non-social aspects of the self that require neither competing against or maintaining harmony with others, leading them to rely on related non-social activities to restore their self-esteem following an unfair event.

Practical Implications

In addition to building knowledge about the antecedents of unfair behaviour directed toward innocent others, the current research sought to inform organizational practice, with the ultimate goal of helping to mitigate unfair behaviour among co-workers within organizations. Taken as a whole, the results of the current research suggest that an initial act of unfairness, such as a supervisor's unfair treatment of an

employee, may have a ripple effect throughout an organization. That is, employees with a strong independent self-construal who experience unfair treatment from an authority—against whom acts of revenge are difficult to carry out—may be more likely to "pass on" the unfairness to their co-workers. After experiencing unfairness at the hands of a colleague, prior research suggests that those co-workers with a stronger independent self-construal may in turn be especially likely to engage in revenge against the offending colleague (Zdaniuk & Bobocel, 2009). Given that this chain of events is most likely to occur between co-workers who have strong independent self-construals, one can easily imagine how a vicious cycle of unfairness and revenge might ensue.

Based on this research, an obvious recommendation for organizational authorities who wish to mitigate unfair behaviour among employees within their organization or workgroup is to treat employees fairly in the first place. Admittedly, this is not new advice. For decades, the organizational justice literature has forewarned employers about the dangers of treating employees unfairly and extolled the virtues of treating employees fairly. Unfortunately, human oversight and unforeseen circumstances make this advice difficult to act upon at all times. Given the realities and limitations of life within organizations, an additional recommendation for employers may be to reconsider their management practices.

Recall that individuals possess both an independent and interdependent self-construal, and that these self-construals can be primed by situational factors (Gardner et al., 1999; Singelis, 1994; Trafimow et al., 1991; Triandis, 2001). It follows that an individualistic work climate promoting personal autonomy, uniqueness, and the use of assertive behaviour to fulfill personal goals may increase the accessibility of

employees' independent self-construals while at work. Unfortunately, organizations and workgroups that harbour such a climate may inadvertently increase the instance of unfair behaviour—and continuous cycles of revenge—among employees as a result. Alternatively, a collectivistic work climate that promotes group harmony and the use of cooperative behaviour to fulfill group goals may have the opposite effect of encouraging fair behaviour among employees by increasing the accessibility of their interdependent self-construals (see Zdaniuk & Bobocel, 2009, for a similar argument).

Conclusion

The justice literature has only recently begun to examine the antecedents of unfair and fair behaviour. The current studies provide a glimpse into how prior unfair treatment by an authority may interact with self-construal to predict unfair and fair behaviour directed toward innocent others. It is hoped that future research will continue to uncover additional dispositional and situational factors that influence individuals' propensities to behave unfairly or fairly when interacting with friends, colleagues, and co-workers. Armed with this knowledge, organizational leaders will be better equipped to prevent unfairness in the first place, rather than attempting to minimize the damage after unfairness has occurred.

Appendix A: Independent and interdependent self-construals scale used in Studies 1-3

Study 1 and 2 instructions: This is a survey of general opinions concerning a variety of social dynamics. You will probably find that you agree with some of the statements and disagree with others, to varying extents. There are no right or wrong answers. Please indicate how you feel about each statement by selecting the appropriate number using the following scale. Please respond as accurately as possible.

Study 3 instructions: Different grad students have different opinions about their grad program and about their fellow grad students. We are interested in your opinions. Please indicate the extent to which you agree or disagree with each of the following statements using the scale below, **which make reference to your experiences in your grad program**. Remember, there are no right or wrong answers.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Moderately agree	Strongly agree

1. I have respect for the authority figures with whom I interact.
2. It is important for me to maintain harmony with my group.
3. My happiness depends on the happiness of those around me.
4. I would offer my seat in a bus to my professor.
5. I respect people who are modest about themselves.
6. I will sacrifice my self-interest for the benefit of the group I am in.
7. I often have the feeling that my relationships with others are more important than my own accomplishments.
8. I should take into consideration my parents' advice when making education or career plans.
9. It is important to me to respect decisions made by the group.
10. I will stay in a group if they need me, even when I'm not happy with the group.
11. If I had a brother or sister who failed, I would feel responsible.
12. Even when I strongly disagree with group members, I avoid an argument.
13. It annoys me when other people perform better than I do.

14. Competition is the law of nature.

15. When another person does better than I do, I get tense and aroused.

16. Winning is everything.

17. It is important that I do my work better than others.

18. I enjoy working in situations involving competition with others.

19. Some people emphasize winning; I'm not one of them.

20. Without competition, it is not possible to have a good society.

Appendix B: Fictitious experimenter evaluation form used in Study 1

Group member's first name: _____

In addition to examining and comparing the performance of individuals versus groups, we also want to promote learning about your strengths and weaknesses in working in a group. The following are the experimenter's observations about your contributions on the group decision-making task.

1. To what extent did the group member show a professional attitude while completing the decision-making task?

1	2	**3**	4	5	6	7
Group member was not at all professional			Group member was moderately professional			Group member was very professional

2. To what extent did the group member use his or her time effectively?

1	2	3	4	**5**	6	7
Group member was not at all time-effective			Group member was moderately time-effective			Group member was very time-effective

3. To what extent did the group member:

   a. Have high quality ideas?

1	2	3	**4**	5	6	7
Not at all			Moderately			Very much

   b. Explain his or her ideas adequately?

1	2	3	4	**5**	6	7
Not at all			Moderately			Very much

   c. Spend enough time thinking of costs and benefits for each potential solution?

1	2	**3**	4	5	6	7
Not at all			Moderately			Very much

4. How did the group member's performance compare to other group members you have observed in previous sessions?

1	2	**3**	4	5	6	7
Worse than most			Average			Better than most

5. In general, to what extent do you think this person was a good group member?

1	2	3	**4**	5	6	7
Not at all			Moderately			Very much

Note. Bolded values represent the fictitious rating participants received from the experimenter.

Appendix C: State self-esteem scale used in Study 1

Instructions: This is a questionnaire designed to measure what you are thinking and feeling at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions, as they are true for you RIGHT NOW.

1	2	3	4	5	6	7
Not at all			Moderately			Very much

1. I am worried about whether I am regarded as a success or failure. (R)
2. I feel that others respect and admire me.
3. I feel self-conscious. (R)
4. I feel displeased with myself. (R)
5. I am worried about what other people think of me. (R)
6. I feel inferior to others at this moment. (R)
7. I feel concerned about the impression I am making. (R)
8. I am worried about looking foolish. (R)
9. I feel confident in my abilities.
10. I feel frustrated or rattled about my performance. (R)
11. I feel that I have trouble understanding things that I read. (R)
12. I feel as smart as others.
13. I feel confident that I understand things.
14. I feel that I have less scholastic ability right now than others. (R)
15. I feel like I'm not doing well. (R)
16. I feel confident about my decision-making abilities.

Appendix D: Partner evaluation form used in Study 1

Partner's first name: _____

Evaluator's first name: _____

In addition to examining and comparing the performance of individuals versus groups, we would like you and your partner to evaluate each other as well. Please keep in mind your experiences with your partner during the decision-making task when answering the questions below. Your partner will NOT see this evaluation.

1. To what extent did your partner show a professional attitude while completing the decision-making task?

1	2	3	4	5	6	7
Partner was not at all professional			Partner was moderately professional			Partner was very professional

2. To what extent did your partner use his or her time effectively?

1	2	3	4	5	6	7
Partner was not at all time-effective			Partner was moderately time-effective			Partner was very time-effective

3. To what extent did your partner:

   a. Have high quality ideas?

1	2	3	4	5	6	7
Not at all			Moderately			Very much

   b. Explain his or her ideas adequately?

1	2	3	4	5	6	7
Not at all			Moderately			Very much

   c. Spend enough time thinking of costs and benefits for each potential solution?

1	2	3	4	5	6	7
Not at all			Moderately			Very much

4. How did your partner's performance compare to other group members you have worked with in the past?

1	2	3	4	5	6	7
Worse than most			Average			Better than most

5. In general, to what extent do you think this person was a good partner?

1	2	3	4	5	6	7
Not at all			Moderately			Very much

Appendix E: Experimenter script used in Study 2 to manipulate unfairness in the unfair treatment condition

"To be honest, when I met you, I didn't expect you to do very well on this task, and you didn't. So, for the overall rating, I decided to give you 4 out of 10. Basically, you didn't show enough creativity. As I said earlier, creativity is closely linked to general intelligence and managerial ability. I realize you're probably disappointed, but I really don't want to get into the details."

Appendix F: Fictitious experimenter evaluation form used in Study 2 to manipulate unfairness in the unfair treatment condition

Group member's first name: _____

The following are the experimenter's observations about your contributions on the group decision-making task. Please keep in mind the experimenter's observations are relative to other group members in previous sessions.

1. In your opinion, to what extent did this group member show creativity while completing the decision-making task?

1	2	**3**	4	5	6	7	8	9	10
Not at all									Very much

2. In your opinion, how did the group member's performance compare to other group members you have observed in previous sessions?

1	2	3	**4**	5	6	7	8	9	10
Worse than most									Better than most

3. In general, to what extent do you think this person was a good group member?

1	2	3	**4**	5	6	7	8	9	10
Not at all									Very much

4. OVERALL IMPRESSION: **4/10**

Note. Bolded values represent the fictitious rating participants received from the experimenter.

Appendix G: Partner evaluation form used in Study 2

Partner's first name: _____

Evaluator's first name: _____

In addition to examining your performance on the group decision-making task, we would like you and your partner to evaluate each other as well. Please keep in mind your experiences with your partner during the decision-making task when answering the questions below. Your partner will NOT see this evaluation.

1. To what extent did your partner show creativity while completing the decision-making task?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

2. To what extent did your partner use his or her time effectively?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

3. To what extent did your partner:

   a. Have high quality ideas?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

   d. Explain his or her ideas adequately?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

   e. Spend enough time thinking of costs and benefits for each potential solution?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

4. How did your partner's performance compare to other group members you have worked with in the past?

1	2	3	4	5	6	7	8	9	10
Worse than most									Better than most

5. In general, to what extent do you think this person was a good partner?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much

Appendix H: Pre-study survey and daily survey measures completed by Student 1 and Student 2

	Student 1	Student 2
Pre-study survey	Independent and interdependent self-construals	—
	Baseline program-based self-esteem	—
	Fairness environment	—
	General attitude toward Student 2	General attitude toward Student 1
	Demographic information	Demographic information
Daily survey	Daily contact with supervisor	Daily contact with Student 1
	Supervisor treatment	Student 1 behaviour toward Student 2
	Daily program-based self-esteem	—

Appendix I: Fairness environment scale used in Study 3

Instructions: What is your grad program like most of the time? Please indicate the extent to which you agree or disagree with each of the following statements.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Moderately agree	Strongly agree

1. Grad students are able to express their views about decisions that affect them.
2. Grad students have influence over decisions that affect them.
3. Decisions that affect grad students are applied consistently.
4. Decisions that affect grad students are unbiased.
5. Decisions that affect grad students are based on accurate information.
6. Decisions that affect grad students adhere to appropriate ethical and moral standards.
7. Faculty supervisors treat grad students in a polite manner.
8. Faculty supervisors treat grad students with dignity.
9. Faculty supervisors treat grad students with respect.
10. Faculty supervisors refrain from making improper remarks or comments.
11. Grad students treat each other in a polite manner.
12. Grad students treat each other with dignity.
13. Grad students treat each other with respect.
14. Grad students refrain from making improper remarks or comments about each other.
15. Faculty supervisors are open and honest in their communications with grad students.
16. Faculty supervisors thoroughly explain decisions to grad students who are affected.

17. Faculty supervisors provide reasonable explanations for decisions to grad students who are affected.
18. Faculty supervisors communicate relevant information to grad students in a timely manner.

The following four questions refer to the outcomes that grad students receive from their grad program, including grades, praise, recognition, job opportunities, and funding.

19. The outcomes that grad students receive reflect the effort they put into their work.
20. Grad students' outcomes are appropriate for the work they do.
21. Grad students' outcomes reflect what they contribute to the program.
22. Grad students' outcomes are justified, given their performance.
23. Overall, I believe my grad program is fair.
24. Overall, people treat each other fairly in my grad program.

Appendix J: Daily supervisor treatment questionnaire used in Study 3

Instructions: The following questions refer to **your faculty supervisor**'s interactions with you **today**. Please answer these questions as they apply to you, rather than to other grad students whom your faculty supervisor may have also interacted with.

Today, to what extent has your supervisor treated you:

Fairly	1	2	3	4	5	6	7	Unfairly
Unbiased	1	2	3	4	5	6	7	Biased
Honestly	1	2	3	4	5	6	7	Dishonestly
Positively	1	2	3	4	5	6	7	Negatively
Sensitively	1	2	3	4	5	6	7	Insensitively
Respectfully	1	2	3	4	5	6	7	Disrespectfully
Warmly	1	2	3	4	5	6	7	Coldly
Politely	1	2	3	4	5	6	7	Impolitely

Was there a time **today** when your faculty supervisor behaved **unfairly** toward you? If so, please describe the situation and why you thought your faculty supervisor was being unfair.

_____

_____

_____

Appendix K: Program-based self-esteem scale used in Study 3

General instructions: For this next set of questions, think about your experiences in your grad program in general. Please indicate the extent to which you agree or disagree with each of the following statements, **which make reference to your grad program** (i.e., "around here").

Daily instructions: For this next set of questions, think about your experiences in your grad program **today**. Keeping this timeframe in mind, please indicate the extent to which you agree or disagree with each of the following statements, which make reference to your grad program (i.e., "around here") **today**.

1	2	3	4	5	6	7
Strongly disagree	Moderately disagree	Slightly disagree	Neither disagree nor agree	Slightly agree	Moderately agree	Strongly agree

1. I am taken seriously around here.
2. There is faith in me around here.
3. I am trusted around here.
4. I count around here.
5. I make a difference around here.

Appendix L: Daily student 1 fairness behaviour and behaviour count scales used in Study 3

Instructions: The following questions refer to the grad student (the other member of your pair) who is completing the Student 1 Surveys. These questions ask about your interactions with this grad student **at school today**. Please answer these questions as they apply to you, rather than to other grad students whom this person may have also interacted with.

At school today, to what extent has this grad student treated you in the following ways:

Fairly	1	2	3	4	5	6	7	Unfairly
Unbiased	1	2	3	4	5	6	7	Biased
Honestly	1	2	3	4	5	6	7	Dishonestly
Positively	1	2	3	4	5	6	7	Negatively
Sensitively	1	2	3	4	5	6	7	Insensitively
Respectfully	1	2	3	4	5	6	7	Disrespectfully
Warmly	1	2	3	4	5	6	7	Coldly
Politely	1	2	3	4	5	6	7	Impolitely

At school today, how many times did this grad student engage in the following behaviours?

__ Not at all
__ Once
__ Twice
__ Three times

1. Said or did something hurtful to you.
2. Made fun of you.
3. Lost their temper at you.
4. Left their work for you to finish.
5. Acted rudely toward you.
6. Gossiped about you.

7. Lied to you.
8. Refused to help you.
9. Took credit for your work.
10. Ignored or refused to talk to you.
11. Helped you after you had been absent.
12. Assisted you without being asked.
13. Took time to listen to your problems or worries.
14. Went out of their way to help you.
15. Complimented you.
16. Passed along valuable information to you.
17. Gave up time to help you with school-related problems.
18. Bragged about your accomplishments.
19. Stood up for you.
20. Gave helpful advice to you.

Appendix M: Study 3 hypotheses and results summary

Hypothesis	Criterion Variable	Results
H6: Student 1 participants with a strong, rather than weak, independent self-construal will act more unfairly toward Student 2 on days when they are treated more unfairly by their supervisor	Student 1 fairness behaviour	H6 not supported: Student 1 participants with a *weak*, compared to strong, independent self-construal acted more *fairly* on days when they were treated more unfairly by their supervisor
	Student 1 negative behaviour	H6 not supported: Effect of independent self-construal x supervisor treatment emerged only when controlling for fairness environment (see H9 below); Student 1 participants with a *strong*, compared to weak, independent self-construal showed a larger *decrease* in negative behaviours on days when they were treated more unfairly by their supervisor
H7: Student 1 participants with a strong, rather than weak, interdependent self-construal will act more fairly toward Student 2 on days when they are treated more unfairly by their supervisor	Student 1 fairness behaviour	H7 supported
	Student 1 positive behaviour	H7 supported; in addition, participants with a *weak*, compared to strong, interdependent self-construal engaged in *fewer* positive behaviours on days when they were treated more unfairly by their supervisor
H8: Student 1 participants will report lower program-based self-esteem on days when they are treated more unfairly by their supervisor	Daily program-based self-esteem	H8 supported

Hypothesis	Criterion Variable	Results
H9: Student 1 participants with a strong, rather than weak, independent self-construal will act more unfairly toward Student 2 when treated more unfairly by their supervisor if they perceive a weak, rather than strong, fairness environment	Student 1 fairness behaviour	H9 not supported: No effect of independent self-construal x fairness environment x supervisor treatment
	Student 1 negative behaviour	H9 not supported: No effect of independent self-construal x fairness environment x supervisor treatment
H10: Student 1 participants with a strong, rather than weak, interdependent self-construal will act more fairly toward Student 2 on days when they are treated more unfairly by their supervisor if they perceive a strong, rather than weak, fairness environment	Student 1 fairness behaviour	H10 not supported: No effect of interdependent self-construal x fairness environment x supervisor treatment
	Student 1 positive behaviour	H10 not supported: No effect of interdependent self-construal x fairness environment x supervisor treatment

Appendix N: Study 3 qualitative responses

Description of Unfairness	Justice violation
Submitted an abstract improperly with my name on it	Distributive
made me take on more work than necessary	Distributive
He did not bother checking in with my latest research when I asked him to.	Distributive
failing to meet his promises of helping out with a task for my thesis, making me wait weeks only to tell me he's not going to do it and I have to -- essentially wasting my time	Distributive/ informational
Made me do all the work that needed to be done for an inspection without help or guidance; didn't acknowledge the results I showed him in a positive manner	Distributive/ interpersonal
being terse and unhelpful in solving problems, being rude and pushing all of the responsibility on me to solve technological problems that are not directly applicable to my research	Distributive/ interpersonal
My advisor has no time to review my work, and has made others students work the priority.	Procedural
Funded another student for the summer and didn't offer me the same opportunity	Procedural
Allowed a visiting speaker a longer time to speak with another graduate student.	Procedural
refused to answer questions in a timely manner	Informational
Reduced my salary without telling me	Informational

not explaining what she had already done for my project	Informational
Informed us of changed test format right before we wrote the test.	Informational
Created a whole apparatus for containing animals only to be told it wasn't good enough when they escaped (even though they had escaped before from it)	Informational
Changed my funding without informing me or explaining why.	Informational
After not setting a clear meeting time for today, he chastised me via email for being late.	Informational
I had results to show him and when we sat down to talk about them he got distracted by something else and never came back.	Interpersonal
He said something about being "girly" and giggling when he heard me laughing at something. I thought it was rude.	Interpersonal
He may have been having a bad day and it showed when we were interacting.	Interpersonal
He brushed me off when I tried to tell him something.	Interpersonal
Glibly dismissing literature research I've done (at his behest) with little interest	Interpersonal
completely ignoring my communications over an instant messanger mid conversation when he had responded and was there	Interpersonal
being terse, unpolite and unhelpful when asked a question/given a reminder about something he needed to do for me a long time ago. Avoided the questions all together and then disappeared offline from our online conversation	Interpersonal

Note. Participants' responses are without corrections for grammar, punctuation, or spelling.

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