

Whatever it takes: Rivalry and unethical behavior

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Abstract

This research investigates the link between rivalry and unethical behavior. We propose that people will be more willing and likely to engage in unethical behavior when competing against their rivals than when competing against non-rival competitors. Further, we argue that rivalry may act as a mindset such that mere exposure to one's rivals can be enough to incite unethical behavior even in domains unrelated to that rivalrous relationship. Across a series of experiments and an archival study, we found that rivalry was associated with over-reporting of performance, deception, and unsportsmanlike behavior. Further, we observed that merely thinking about a rival was enough to increase unethicality. These findings highlight the importance of rivalry as a widespread, powerful, yet largely unstudied phenomenon with significant organizational implications. Further, the results help to inform when and why unethical behavior occurs within organizations, and demonstrate that the nature of competition is dependent upon actors' relationships and prior interactions.

“I want them on their knees. Begging for mercy. Pleading for their lives. Confessing every sin. Kill! Kill! Kill!”

Oracle CEO Larry Ellison, “speaking” to fellow executives about Ingres, his company’s primary rival in the early 1980s.¹

A wide range of anecdotal evidence suggests that certain competitors – rivals – can push us to pursue victory with a fervency that goes beyond the bounds of normal, and often ethical, competitive behavior. In athletics, few can forget the brutal physical attack perpetrated by Tonya Harding’s ex-husband against her rival Nancy Kerrigan in the 1994 Winter Olympics. In the U.S. military, inter-service rivalries (e.g., The Air Force vs. The Navy) have been linked to unethical practices such as fudging performance data (Ash, 2001). In business, British Airways’ executives admitted in a 1993 libel suit that they had engaged in a “dirty tricks” campaign against rival Virgin Atlantic, which included stealing Virgin’s confidential data, calling Virgin’s customers to tell them their flights had been cancelled, and circulating rumors that Virgin CEO Richard Branson was infected with HIV (Gregory, 1994).

Such examples suggest that the experience of rivalry goes beyond that of everyday competition. However, researchers have generally treated rivalry and competition as one and the same, leaving us largely uninformed about this prevalent and potentially powerful phenomenon. Here, we build upon recent research in drawing a distinction between rivalry and general competition, conceptualizing rivalry as a subset of competition that is uniquely relational. We then examine the effects of rivalry and non-rival competition on unethical behavior, with the prediction that rivalry will make people more willing to do “whatever it takes” to get ahead, independent of

¹ White, 2001, pp. 373-374

what is tangibly at stake in the competition. In doing so, we aim to extend understanding of both rivalry and the causes of unethical behavior within and outside of organizations. More broadly, this work constitutes some of the first to bring a historical and relational perspective to the study of competition and ethical decision-making.

RIVALRY, COMPETITION, AND UNETHICAL BEHAVIOR

Rivalry and competition

Competition is everywhere, in nature and modern civilization alike, and thus has long been a topic of interest to researchers across the social sciences. Prevailing theoretical models within management, economics, and psychology view competition in structural terms – as a situation in which the objective outcomes of actors are opposed to one another; that is, the actors are vying for the same scarce resources (e.g., Deutsch, 1949; Porter, 1980; Scherer & Ross, 1990). For instance, competition between individuals has been manipulated by offering a reward to the highest performer (e.g., Beersma, Hollenbeck, Humphrey, Moon, & Conlon, 2003; Scott & Cherrington, 1974) or by giving individuals the goal of outperforming each other (e.g., Deci, Betley, Kahle, Abrams, & Porac, 1981; Tauer & Harackiewicz, 1999). Similarly, competition between organizations has been measured by the extent to which firms operate in the same markets, vying for the limited resources of customers and market share (e.g., Chen, 1996; Greve, 1998).

Within these literatures, the word “rivalry” is generally used synonymously with competition; rivals are simply actors in competition with one another, whether at the individual (e.g., Wankel,

1972) or organizational levels (e.g., Katila & Chen, 2008; Porter, 1980). However, in line with recent research (Kilduff, Elfenbein, & Staw, 2010), we believe that there is more to rivalry than just a state of opposing goals or contested resources. Equating rivalry with such ‘structural’ competition fails to capture the relational and historical factors that we believe are essential features of rivalry. Are Microsoft and Google rivals simply because they compete in the same industries at a given moment in time? Is the rivalry between Oxford and Cambridge University nothing more than a current state of conflicting goals? Why are Pete Sampras and Andre Agassi still so fiercely competitive with one another, a decade after any meaningful competition between them, and even during matches staged purely for charity purposes (<http://www.aolnews.com/2010/03/13/agassi-sampras-feud-publicly-at-charity-event>)? In each of these examples, there exists a relationship and history that goes beyond just a current state of conflict over tangible resources. We attempt to capture the unique nature of these relationships by proposing a conceptualization of rivalry as an inherently relational form of competition, which we elaborate on below.

We believe that distinguishing rivalry and competition is not only conceptually defensible, but important to understanding and predicting behavior within competitive environments. Prior research, in conceptualizing competition in purely structural or economic terms, has neglected to consider how competitors’ relationships and histories of interaction may alter their behavioral responses to competition. At the individual level, laboratory studies of competition typically pit unacquainted participants against one another (e.g., Beersma et al, 2003; Deci et al., 1981), and field studies rarely measure whatever relationships may exist (e.g., Tauer & Harackiewicz, 2004; Brown, Cron, & Slocum, 1998). At the organizational level, competition is often treated as a

property of the industry (e.g., Hannan & Freeman, 1989; Scherer & Ross, 1990) with competing firms depicted as anonymous actors (Porac, Thomas, Wilson, Paton, & Kanfer, 1995). However, it is not hard to imagine that a longstanding or familiar foe might evoke very different psychological and behavioral reactions from an unfamiliar or anonymous one.

Indeed, the importance of relational factors in competition is suggested by findings within a number of related literatures. At the individual level, researchers have found that behavior and outcomes in economic games and negotiations vary by the prior interactions of participants (Bettenhausen & Murnighan, 1991; Drolet & Morris, 2000; Sivanathan, Pillutla, & Murnighan, 2008; Thompson, Valley, & Kramer, 1995; Valley, Neale, & Mannix, 1995;). At the organizational level, the ‘competitive dynamics’ literature has adopted the firm-dyad as the level of analysis, and finds that competitive behavior is affected by the relative characteristics of firms (e.g., Baum & Korn, 1999; Chen, 1996; Ferrier, 2001), such as their level of multimarket contact (Baum & Korn, 1999), market overlap (Baum & Korn, 1996), relative size (Chen, Su, & Tsai, 2007), and resource similarity (Chen, 1996). A related body of work argues that the behavior of firms depends upon managers’ subjective perceptions of their firms’ competitors, which may diverge substantially from objective measures of the competitive environment (Chen et al., 2007; Porac, Thomas, & Baden-Fuller, 1989; Porac, Thomas, Wilson, Paton, & Kanfer, 1995; Reger & Palmer, 1996). These literatures still largely overlook the past history of interaction between firms, but they take a step towards a relational model of competition in emphasizing the importance of the dyad, firms’ characteristics relative to one another, and factors beyond purely objective and structural measures of competition. Lastly, at the country level, researchers have begun to recognize that conflict between nation states cannot be understood solely from the

current situation – instead, histories of past interaction between states must be also be considered (Goertz & Diehl, 1993; Stinnett & Diehl, 2001; Thompson, 1995).

Conceptualization of rivalry

We follow Kilduff et al., (2010) in conceptualizing rivalry as a relationship between a focal actor and a target actor that is characterized by heightened psychological stakes of competition for the focal actor when in competitions against the target actor, independent of the objective characteristics of the competition, including objective stakes. By psychological stakes, we mean the subjective importance placed upon competitive outcomes achieved in a given competition (i.e., win or loss). Rivalry exists when the psychological stakes are increased as a result of the existing relationship between the focal and target actors independent of objective stakes or other structural or situational characteristics. Below, we discuss the factors which can lead to the development of such a relationship, including repeated competition and closely-decided past contests.

Our conceptualization of rivalry can be seen as analogous to how we might conceptualize friendship – as a relationship that is characterized by increasing liking and familiarity, which emerges from such factors as repeated social interaction and similarity in interests. In both friendship and rivalry, the psychological significance of a current interaction is intensified because of the existing relationship between the focal and target actors, independent of the objective features of their current interaction.

It is worth noting how this conceptualization of rivalry overlaps with, and also diverges from, the traditional definition of competition as a current state of opposing goals, what we will call ‘structural competition’ (Deutsch, 1949). First, competition against one’s rivals is clearly a form of competition more broadly – for rivalry to exist, there must be some competition for valued outcomes or opposition between goals, at least in the minds of the actor(s). However, due to its relational nature, rivalry differs from structural competition in two important ways. First, rivalry entails a focus on a specific, identifiable, opponent. With structural competition, the significance of one competitor versus another is simply driven by the level of objective threat each poses to the focal actor’s goals, and thus competitors are often interchangeable with one another. Structural competition can take place between unknown or anonymous opponents, and this is often how it has been studied. By contrast, given that rivalry represents a relationship, it is always directed toward a known competitor. Second, rivalry, unlike structural competition, has a historical component to it. Relationships are built up over a series of interactions, and thus rivalry cannot be fully captured by the characteristics of the current competitive setting. This is a critical distinction – although structural models of competition implicitly assume that history does not matter, we believe that it can play a substantial role.² To summarize, a rival is an opponent with whom the focal actor has an existing relationship that serves to increase the psychological stakes of competition; whereas a non-rival is an opponent with whom such a relationship is lacking, including, but not restricted to, first-time, unfamiliar, or anonymous competitors.

² This conceptualization of rivalry also differs from work that has used ‘rivalry’ to indicate competitors of proximate hierarchical rank (Bothner, Kang, & Stuart, 2007; Garcia, Tor, & Gonzalez, 2006).

Consistent with the distinction drawn above, a few researchers have very recently begun to investigate rivalry as something more than a synonym for competition. Neave & Wolfson (2003) surveyed professional soccer players and asked them to identify the opposing team towards whom they felt the “greatest degree of rivalry,” and then observed that testosterone levels were higher prior to matches against these teams than matches against other teams within the same league. Researchers studying auction fever have speculated that feelings of rivalry may explain why bidders are more likely to exceed their bidding limits when facing a few, rather than many, competing bidders – that is, rivalry between bidders may be intensifying their desire to win (Ku, Malhotra, & Murnighan, 2005; Malhotra, 2010). Lastly, a recent archival study examined the emergence of rivalry within NCAA basketball, and found that perceived rivalry between teams indeed varied according to their relationships and past interactions – rivalry tended to form between more similar opponents, and over repeated and evenly-matched competition (Kilduff, et al., 2010).

This existing work on rivalry is still in its nascent phase, however, and there have been no systematic investigations into whether competition against rivals has meaningfully different consequences for behavior than competition against non-rivals, independent of objective stakes. Kilduff et al. (2010) did observe a correlation between the intensity of rivalry between basketball teams and defensive performance in their games together. However, these results are difficult to interpret given the unique nature of this behavior and the lack of control provided by this archival setting; for instance, they were unable to control for objective stakes. Here, we conduct the first systematic investigation into whether rivalry and non-rival competition have different effects on competitive behavior, specifically, unethical behavior.

Rivalry and unethical behavior

The question of when and why people engage in unethical behavior is an important one for both academics and practitioners, given its costly and destructive consequences for individuals, organizations and society. Consistent with prior researchers, we define unethical behavior as behavior that falls outside of generally accepted norms of moral behavior, such as cheating, lying, or stealing (Reynolds & Ceranic, 2007; Treviño, Weaver, & Reynolds, 2006).

Existing research has identified a range of factors that can contribute to unethical behavior (for a review see Kish-Gephart, Harrison, & Treviño, 2010), as well as the related construct of organizational misconduct, which includes organization-level unethical behavior as well as behavior that may be less intentional (for a review, see Greve, Palmer, & Pozner, 2010). Both individual factors, such demographic characteristics (e.g., age and gender) and dispositional traits (e.g., locus of control, cognitive moral development), and situational and environmental characteristics (e.g., norms, honor codes, organizational culture) can influence unethical behavior and organizational misconduct (Greve et al., 2010; Kish-Gephart et al., 2010; Whitley, 1998).

Most germane to the current research, some prior work has identified competition as a driver of unethical behavior (e.g., Kohn, 1992; Hegarty & Sims, 1978; Perry, Kane, Bemesser, & Spicker, 1990; Vaughan, 1999). For example, in a business simulation, MBA students more often allowed their salesmen to provide illegal ‘kickbacks’ to purchasing agents when they were placed in competition with one another, provided that this behavior benefited their performance (Hegarty & Sims, 1978). However, there exist some notable exceptions to the positive link

between competition and unethical behavior (e.g., Schwepker, 1999), and researchers have largely failed to outline the conditions under which this is more or less likely to be true. In particular, it is unclear in past research whether or not any rivalry existed between the competitors – thus, rivalry and non-rival competition have been generally confounded.

We propose that the effects of competition on unethical behavior will depend upon whether one is competing against a rival versus a non-rival. Specifically, we predict that competition against a rival will lead to increased unethical tendencies as compared non-rival competition, for the following reasons.

Historically, research on unethical behavior, and on ethical decision-making more generally, has depicted the underlying psychological processes as conscious and rational. Prominent models within the literatures on crime, academic dishonesty, and deception have proposed that people undergo cost-benefit analyses when deciding whether to behave unethically, weighing the perceived benefits of the behavior against the perceived costs (e.g., Becker, 1968; Eccles, 1983; Greve et al., 2010; Lewicki, 1983; Wigfield & Eccles, 1992). Similarly, at the organizational-level, rational-choice perspectives posit that organizations weigh potential benefits and costs to organizational reputation in decisions to engage in misconduct (e.g., Karpoff, Lee, & Vondryk, 1999; Kreps & Wilson, 1982). Thus, a primary way in which competition may foster unethical behavior is by increasing the payoffs associated with high-ranking performance, encouraging unethical behavior that confers a competitive advantage such as cheating or sabotage. Rivalry in particular is apt to tip these sorts of cost-benefit analyses in favor of unethical behavior by

increasing the psychological stakes of competition independent of what is tangibly at stake. Thus, our prediction follows from this rational approach to ethical decision-making.

Rivalry may also increase unethical behavior in a less conscious and calculative manner. Researchers studying unethical behavior have increasingly demonstrated that it is often the result of automatic rather than conscious cognitive processes – ethical decisions are often snap judgments governed by impulses, emotions, and decision frames rather than rational deliberation (Haidt, 2001; Kern & Chugh, 2009; Reynolds, 2006; Sunstein, 2005; Tenbrunsel & Messick, 1999; Tenbrunsel, Diekmann, Wade-Benzoni, & Bazerman, 2010). For example, moral decisions can be influenced by incidental emotions that are unrelated to the decision context (Wheatley & Haidt, 2005). Even at the organizational level, researchers have argued that misconduct sometimes “proliferates throughout an organization largely through processes that can be considered mindless” (Greve et al., 2010, pg. 76).

In line with this work, we explore whether rivalry can lead to increased unethicality in unrelated domains, by triggering a mindset that focuses attention toward performance and away from the means used to achieve it. In doing so, we build upon the literature on priming effects. Research from a variety of domains has shown that exposure to, or recall of, certain stimuli can instill mindsets in individuals that affect their behavior on subsequent tasks. The concept of a mindset refers to a coherent construct that exists in memory, and that when activated, produces a constellation of cognitive characteristics and behavioral propensities (Bargh & Chartrand, 2000). Because a mindset’s propensities are stored in memory, they can be carried outside of the situation in which the mindset is initially experienced or triggered. For example, simply asking

individuals to recall a time in which they had power over others causes them to actually experience the psychological state of power (Galinsky, Gruenfeld, & Magee, 2003), and as a result, to act more assertively (Anderson & Berdahl, 2002; Galinsky et al., 2003; Kilduff & Galinsky, 2013), take greater risks (Anderson & Galinsky, 2006), and behave more aggressively (Fast & Chen, 2009). We propose that a rivalry mindset can be activated by a range of indirect cues, thoughts, or experiences associated with one's rival. Thus, merely seeing or thinking about a rival might be enough to trigger feelings of rivalry, which could then lead to unethical behavior outside of the original rivalry context. In the current research, we employ priming techniques in several of our studies to test this idea.

Hypothesis 1 (H1): The experience of rivalry will result in increased unethical behavior compared to non-rival competition, both in terms of behavior directed at the rival and more generally.

We also test the idea that rivalry fosters increased psychological stakes, and that it is this increase in the subjective importance placed upon competitive outcomes that helps explain the link between rivalry and unethical behavior.

Hypothesis 2 (H2): The positive link between rivalry and unethical behavior will be mediated by increased psychological stakes of competition.

A scattering of empirical results provide indirect support for these hypotheses. First, individuals adopting performance or achievement goals, which involve the desire to outperform others and

demonstrate superiority, are more likely to engage in academic dishonesty than individuals adopting mastery goals, which reflect the desire to develop one's competence and improve relative to one's own past performance (Anderman, Griesinger, & Westerfield, 1998; Anderman & Midgley, 2004; Murdock, Hale, & Weber, 2001). Second, "win-framed" negotiators, who are focused more on outperforming their negotiation counterpart than on achieving mutual benefits, are more likely to deceive their counterparts (Schweitzer, DeChurch, & Gibson, 2005). These results are consistent with the idea that greater subjective emphasis on one's performance relative to a specific other opponent will increase unethical behavior.

Antecedents of rivalry

A secondary goal of this work is to extend findings on the antecedents of rivalry, or the relational factors that heighten the psychological stakes of competition. Any given instance of rivalry may derive in part from idiosyncratic factors or events, but for the construct to be useful for predicting behavior, we need an understanding of the typical conditions under which rivalry develops. Further, investigation into the causes of rivalry may help to illuminate how and why competitors' relationships and past interactions can affect the psychological importance of competition. We build upon recent work on the antecedents of rivalry between basketball teams (Kilduff et al., 2010) in testing whether rivalry between individuals more generally can be predicted by aspects of their relationships and competitive histories. We focus on three antecedents first proposed by Kilduff et al. (2010): similarity, repeated competition, and evenly-matched competition. It is worth noting that these antecedents are not defining features of rivalry or requirements for it to exist, but rather, conditions that are apt to foster stronger feelings of rivalry between competitors, all else being equal.

First, similarity, despite generally fostering greater attraction and cooperation (e.g., McPherson, Smith-Lovin, & Cook, 2001; Newcomb, 1963), may lead to greater rivalry between actors in competition. Social comparison theory (Festinger, 1954) posits that we seek to compare ourselves to others, and that we are more likely to choose targets of similar ability level when doing so. In turn, this tends to breed greater subjective competitiveness and a desire to outperform these individuals independent of objective stakes (Goethals, 1986; Hoffman, Festinger, & Lawrence, 1954). Similarity outside of ability or performance may also increase the psychological importance of relative performance (Goethals & Darley, 1977), due in part to the increased relevance of such comparisons to individuals' sense of identity and status (Britt, 2005; Tesser, 1988). For example, two professional tennis players who are both from Russia may experience an additional drive to achieve the title of top Russian tennis player. Similarity is also associated with competitiveness at the organizational level (Baum & Korn, 1996; Baum & Mezias, 1992; Chen et al., 2007; Porac & Thomas, 1994), although rational, stakes-based explanations are difficult to rule out.³

Second, repeated competition may foster greater rivalry. From a purely rational point-of-view, unless past contests offer information relevant to the current competitive situation, they would not be expected to affect competitive attitudes or behavior – thus, repeated competition should be unrelated to perceived stakes or importance. However, psychologically, it appears that the

³ Although it has not yet been established empirically, it is possible that certain key differences between competitors might also foster greater rivalry, particularly if these differences are along domains central to the competitors' identities. This would be consistent with some recent work suggesting that organizational members (Elsbach & Bhattacharya, 2001) and individuals (Zhong, Galinsky, & Unzueta, 2008; Zhong Phillips, Leonardelli, & Galinsky, 2008) may sometimes derive identity from who they are *not* as much as from who they are. In general, however, similarity appears to be antecedent to rivalry.

experience of competition can leave a lasting ‘residue’ and have enduring consequences for actors’ relationships going forward. A recent study found that individuals randomly assigned to compete with one another were later less able to effectively cooperate, even though it was in their best interest to do so (Johnson et al., 2006). This kind of competitive residue is apt to accumulate over repeated competitive interactions. Research on the “mere exposure” effect (Zajonc, 1968) has found that repeated exposure to a negative stimulus elicits increasingly negative reactions (Brickman, Redfield, Crandall, & Harrison, 1972). Analogously, repeated competition against the same opponent is apt to foster greater and greater subjective competitiveness, or rivalry. Similarly, amongst organizations it is often the longstanding competitors, or those with the longest industry overlap, who are considered to be the fiercest rivals.⁴ Besides overlap in industry tenure, repeated competition between firms could also be assessed in terms of the number of ‘competitive moves’ they have exchanged, such as market entries or new product launches (Chen, 1996).

Lastly, in addition to the sheer quantity of competitive interactions between actors, prior contests that are closely-decided may be particularly important to the formation of rivalry. Narrowly-decided contests have been shown to prompt greater counterfactual thinking – thoughts such as “if things had been slightly different, I would have won” – and as a result, greater rumination and emotional reactions (Kahneman & Miller, 1986; Medvec, Madey, & Gilovich, 1995; Medvec & Savitsky, 1997). Therefore, these contests are most likely to live on in the minds of competitors and contribute to future feelings of rivalry – either directly, via rumination, or due to the fact that

⁴ Competition between firms can also sometimes result in *mutual forbearance*, or a situation in which competitiveness and aggression is actually constrained, particularly amongst firms who compete across multiple markets (Baum & Korn, 1996). However, this is thought to be due to increased concerns over potential retaliation rather than a reduction in subjective rivalry.

we are more likely to form lasting memories of emotionally-charged events (Bradley et al., 1992; Hamann, 2001). At the organizational level, close contests could be thought of in terms of evenly-matched performance in financials during past quarters, or along various other metrics relevant to the industry – for example, on time arrivals or revenues per seat mile in the case of airlines (Miller & Chen, 1996).

The evidence supporting similarity as an antecedent to rivalry and heightened subjective competitiveness is fairly robust; however, much less research has examined the role of past competitive interactions in driving competitive attitudes or behavior. Here, therefore, we focus on the role of repeated and evenly-matched interaction in the formation of rivalry. Although correlations between these factors and rivalry have been observed among basketball teams (Kilduff et al., 2010), we present causal evidence for these relationships and show that they generalize to individuals.

Overview of studies and theoretical contributions

We present four studies that investigated our main hypothesis (H1) that rivalry would be associated with greater unethicity than non-rival competition. Studies 1a and 1b primed rivalry versus non-rival competition with a recall task (Study 1a), and a series of simulated competitions (Study 1b), and examined individuals' willingness to engage in Machiavellian behaviors, such as lying to get ahead. Study 2 investigated the effects of priming rivalry and non-rival competition on the misreporting of performance on a cognitive task. Study 3 examined unethical behavior directed at members of either a rival or non-rival organization, in the form of deception. Study 3 also measured psychological stakes as a mediating mechanism for our main effect (H2). Finally,

Study 4 tested our ideas in a real-world and high-stakes competitive context, looking at the relationship between rivalry and unsportsmanlike conduct in professional soccer.

We seek to make several theoretical contributions with this research. First, we aim to increase understanding of rivalry, a prevalent and potentially powerful phenomenon that has gone largely unstudied to date. We conduct what is to our knowledge the first direct, controlled comparison of rivalry to non-rival competition. Further, we extend existing work suggesting that rivalry may foster greater motivation (Kilduff et al., 2010; Ku et al., 2005; Malhotra, 2010) by exploring the ‘dark side’ of rivalry. Second, we investigate the existence of a rivalry mindset – that is, whether simply thinking about a rivalry relationship can produce greater unethical behavior in subsequent, unrelated domains. Third, we extend scholars’ understanding of the roots of unethical behavior and organizational misconduct by examining rivalry as a previously unexplored antecedent of such behavior, and in doing so, shed light upon the conditions under which competition is more or less likely to corrupt. Finally, our research extends prevailing theoretical models of both competition and unethical behavior by depicting these phenomena as inherently relational – that is, as dependent upon existing relationships between actors and their histories of interaction, in addition to individual and situational characteristics.

METHODS

Study 1a

Participants. 169 undergraduate students from an organizational behavior course participated in the study for course credit (49.7% male, $M_{\text{age}} = 21.9$ years; $SD = 3.70$).

Procedure. Participants arrived at the lab, and were randomly assigned to one of three conditions – rivalry, non-rival competition, and control – as determined by the version of a paper survey that they received. They then completed the Mach IV Machiavellianism scale (Christie & Geis, 1970), which served as our dependent measure, as well as two items to be used as control variables.

Experimental conditions. In the *rivalry* condition, participants were asked to recall and write about a time in which they had competed against a personal rival. Although participants were left to define exactly what that meant to them, they were prompted with factors that we expected to contribute to intensity of rivalry. The exact instructions were as follows:

“Please think back to a time in which you competed against a personal rival (e.g., someone you repeatedly competed against and/or were evenly matched with). Please spend a few minutes describing this person and the thing(s) you competed on (1 – 2 paragraphs). How did you feel towards this person, and while you competed against him or her?”

Thus, this task aimed to induce a rivalry mindset in participants by having them relive a past experience with rivalry. As discussed above, such recall tasks are recognized as an effective way of inducing real-world psychological states, such as the experience of power (e.g., Galinsky et al., 2003) as well as specific emotions (e.g., Tiedens & Linton, 2001). In contrast, participants assigned to the *non-rival competition* condition were asked to recall a recent competitive

experience of any kind, thus allowing for the comparison between rivalry and competition more generally:

“Please think back to the most recent time in which you competed against someone (on anything). Please spend a few minutes describing this person and the thing(s) you competed on (1 – 2 paragraphs). How did you feel towards this person, and while you competed against him or her?”⁵

Finally, participants in the *control* condition were asked to describe their morning commute:

“Please think back to this morning and how you arrived on campus. Please spend a few minutes describing your commute (1 – 2 paragraphs). How did you feel during your commute?”

Measures. Our dependent measure was the Mach IV Machiavellianism personality scale (Christie & Geis, 1970), which assesses individuals’ endorsements of a series of attitudes and behavioral tendencies drawn from the writings of Niccolo Machiavelli. The scale consists of 20 items such as “Never tell someone the real reason you did something unless it is useful to do so,” “It is hard to get ahead without cutting corners here and there,” and “One should take action only when sure it is morally right” (reverse-coded). Participants rated their agreement with each item from 1 (“Strongly disagree”) to 5 (“Strongly agree”); $\alpha = .74$, $M = 48.7$, $SD = 8.37$. We chose Machiavellianism as the dependent variable because this perfectly captures a focus on performance by any means necessary, and because agreement with these statements is “synonymous with amoral action, sharp dealing, hidden agendas, and unethical excess” (Nelson & Gilbertson, 1991, p. 633). Indeed, scores on this scale have been repeatedly shown to predict

⁵ It is possible that some participants in the non-rival competition condition also recalled a personal rival. To the extent that this did occur, however, these data provided a conservative test of our hypothesis.

a wide range of unethical behaviors, including cheating, lying and exploiting others (Hegarty & Sims, 1978; Kish-Gephart et al., 2010; Wilson, Near, & Miller, 1996). Although Machiavellianism is often treated as a stable personality characteristic, the updated view of personality is that it can vary across situations and people's social roles within them (Fleeson, 2001; Heller, Perunovic, & Reichman, 2009; Ozer & Benet-Martinez, 2006). Thus we think it makes sense to assess whether individuals' levels of Machiavellianism respond to exposure to rivalry versus non-rival competition.

We also measured aspects of competition that might covary with rivalry as control variables. Following the recall task, participants in the rivalry and non-rival competition conditions answered two questions about the competitive experience they had just described. First, it is possible that contests against rivals involve higher objective stakes in addition to increased psychological stakes. Thus, we asked participants "How high were the tangible stakes (e.g., money, career success, grades, athletic success, broader reputational benefits, etc.) associated with this competition?" on a scale from 1 ("Nothing tangible at stake") to 7 ("Very high") ($M = 4.16$; $SD = 1.93$). Second, it is possible that competition against rivals involves a greater frequency of failure or defeat than general competition. To control for this, participants answered "To what extent did you succeed or win in this competition?" on a scale from 1 ("Not at all") to 7 ("Very much") ($M = 4.96$; $SD = 1.64$).

Results. An analysis of variance (ANOVA) of participants' Mach IV scores indicated significant differences across conditions, $F(2, 166) = 4.62$, $p = .011$ (all tests are two-tailed). As predicted, participants in the rivalry condition scored the highest ($M = 51.0$, $SD = 7.20$), and planned

contrasts indicated that they scored significantly higher than participants in the non-rival competition ($M = 46.3$, $SD = 8.52$), $t(166) = 2.94$, $p = .004$, $d = .60$, eta-squared = .082 and control conditions ($M = 48.0$, $SD = 8.95$), $t(166) = 1.98$, $p = .050$, $d = .36$, eta-squared = .032. These latter two conditions did not differ significantly from one another, $t(166) = -1.09$, $p = .28$. Furthermore, the difference between the rivalry and non-rival competition conditions remained significant when controlling for success and tangible stakes. In a linear regression analysis, a dummy variable corresponding to condition (0 = general competition; 1 = rivalry) was positive and significant, $\beta = .28$, $t(105) = 2.94$, $p = .004$, whereas tangible stakes ($\beta = .08$, $t(105) = .80$, $p = .43$) and success ($\beta = -.05$, $t(105) = -.47$, $p = .64$) did not significantly predict Mach IV scores. Thus, in support of H1, rivalry predicted higher Mach IV scores relative to non-rival competition, and this was not due to differences in objective stakes or success.⁶

Study 1b

Participants. 170 undergraduate students from an organizational behavior course participated for course credit (44.1% male, $M_{\text{age}} = 21.0$ years; $SD = 2.41$).

⁶ One potential alternative explanation for our results is that participants in the rivalry condition described opponents (personal rivals) that they saw as less ethical, on average, than participants in the general competition condition. In turn, thinking about these less ethical opponents may have caused participants in the rivalry condition to be more likely to engage in unethical behavior, regardless of their feelings of rivalry. We collected some additional data to investigate this possibility. A brief survey was distributed to a sample of 41 undergraduates (58.5% female; average age = 21.5 years), who were randomly assigned to one of two conditions, rivalry and general competition, which were identical to the conditions in Study 1. After the recall task, participants were asked to imagine that they were going to compete against the same person again, and indicated their agreement with two statements, on a scale of “1 – strongly disagree” to “7 – strongly agree”: “This person would take any advantage they could – fair or unfair – to try to beat me” and “I could be sure that this person would behave fairly and follow all the rules of competition” (reverse-coded), $\alpha = .80$. Participants in the rivalry condition did not rate their recalled opponent as more likely to engage in unethical behavior ($M = 2.57$) than participants in the general competition condition ($M = 2.60$), $t(39) = -.05$, $p = .96$, helping to rule out this alternative explanation.

Procedure. The experiment was run across eleven sessions of 14 to 18 participants each. Upon arriving at the lab, participants were informed that they would be completing a series of typing tests in competition with one another. The rest of the instructions for the experiment were provided via the computer workstations. Participants were given an ID number and randomly assigned to one of two conditions, *rivalry* and *non-rival competition*. The experiment began with a one minute practice typing test, after which participants completed a series of four competitive typing tests of two minutes each. Before each of the competitive tests, participants were assigned an opponent in the form of the ID number of another participant, and were told that net typing speed (raw speed multiplied by accuracy) would be used to determine the winner. After each test, participants received feedback on their performance and their opponent's performance, and were given 20 seconds to rest. There were no objective stakes for winning or losing.

The rivalry and non-rival competition conditions were identical in every way, except that we varied the antecedents to rivalry of repeated competition and evenly-matched contests. First, participants in the rivalry condition faced the same opponent on all four competitive typing tests, whereas participants in the non-rival competition condition faced a different opponent on each test. Second, instead of providing participants with the actual performance of their opponents, we manipulated this information to create narrow margins of victory in the rivalry condition (between 2 and 6 words-per-minute (randomly determined) of the participant's net speed), and relatively wider margins of victory in the non-rival competition condition (between 12 and 20 words-per-minute). Thus, participants in the rivalry condition experienced *repeated and evenly matched competition against the same opponent* – conditions designed to foster feelings of rivalry. By contrast, participants in the non-rival competition condition experienced relatively

lopsided competition against a series of different opponents – conditions designed to limit the development of rivalry. Importantly, however, both sets of participants experienced the exact same degree of competition in terms of traditional definitions. Further, we held constant the overall level of success: the opponent’s performance was manipulated so that all participants won the first and third tests, but lost the second and fourth tests.

After completing the typing tests, participants filled out a survey that included manipulation checks, the same Mach IV Machiavellianism scale used in Study 1, and a probe for suspicion. They were then debriefed and thanked for their participation.

Measures. The survey that followed the typing tests contained all of the measures used in this study. Our main DV was the same 20-item Mach IV scale used in Study 1 ($\alpha = .73$; $M = 49.0$; $SD = 7.8$). We also included a manipulation check given that we manipulated the antecedents of rivalry rather than rivalry itself. Participants indicated their level of agreement with the statement “I feel a degree of rivalry towards the person I just typed against (on the last typing test)” on a scale from 1 (“Strongly disagree”) to 7 (“Strongly agree”) ($M = 4.69$; $SD = 1.79$). Finally, given that the opponent scores were manipulated, it was important to check for suspicions. and given a blank text box in which to respond.

Results.

Before conducting our main set of analyses, we first checked participants’ responses to the suspicion question: “Was there anything that took place in today’s experiment that you found strange, suspicious, or out of place?” 20 participants (11.8%) indicated some level of suspicion

(e.g., “The fact that I won, then lost, then won, then lost. It seemed patterned.”) and were thus excluded. Removal of these participants did not affect any of our results.

We then checked the efficacy of our manipulation. Participants in the rivalry condition reported greater feelings of rivalry towards their opponents (“I feel a degree of rivalry towards the person I just typed against (on the last typing test)”) than did participants in the non-rival competition condition, $M = 5.06$, $SD = 1.75$ vs. $M = 4.41$, $SD = 1.89$, $t(148) = 2.15$, $p = .033$, $d = .36$, $\eta^2 = .030$. Thus, by manipulating repeated competition and narrow margins of victory, we were successful in creating increased feelings of rivalry amongst participants, as

Participants in the rivalry condition also scored higher on the Mach IV Machiavellianism scale than participants in the non-rival competition condition, $M = 50.3$, $SD = 7.69$ vs. $M = 47.7$, $SD = 7.91$, $t(168) = 2.03$, $p = .044$, $d = .33$, $\eta^2 = .026$, supporting H1.

Discussion. Studies 1a and 1b provided preliminary evidence that rivalry fosters a greater willingness to engage in unethical behavior to get ahead. Using two very different manipulations, participants primed with rivalry were subsequently higher in Machiavellianism than participants primed with non-rival competition. It is also worth noting that we used a general measure of Machiavellianism that was unrelated to our manipulations or to participants’ rivals. These findings suggest that rivalry can produce a mindset that subsequently affects unethicality in domains unrelated to the rivalry itself. That merely thinking about a rival generated movement along an individual difference measure suggests that rivalry may have powerful psychological effects. It is also worth noting that the tangible stakes of competition

were unrelated to Machiavellian attitudes, suggesting that there is something unique to rivalry beyond mere heightened stakes. Finally, Study 1b demonstrated that feelings of rivalry can be experimentally manipulated via repeated competition and narrow margins of victory – providing support for these factors as antecedents to rivalry and more generally supporting the idea that the consequences of competition can vary according to competitors’ history of prior interactions.

Study 2

Although Machiavellianism has been repeatedly linked to increased unethical behavior, it was nonetheless important to see whether the effect of rivalry would extend to actual behavior. Thus Study 2 examined actual unethical behavior. Specifically, we examined the influence of rivalry on individuals’ decisions to misreport their performance on a cognitive task, which has been used by a number of researchers as a measure of unethical behavior (e.g., Gino & Pierce, 2009; Schweitzer, Ordóñez, & Douma, 2004; Pierce et al., 2013). Furthermore, we added an additional control variable in Study 2, dislike. It seemed possible that rivals might be generally less liked than non-rival competitors, and so it was important to assess whether this might be driving our findings. Third, we examined a heterogeneous population of U.S. adults rather than employing a student sample, allowing us to test the generalizability of our theory.

Participants. XXX – check sample size One hundred twenty U.S. adults were recruited via Amazon Mechanical Turk, an online service that matches ‘workers’ with ‘requesters’ who post jobs to be completed (see Buhrmester, Kwang, & Gosling, 2011 for more detail on this service as well as analyses that confirm the quality of responses). This provided for a more diverse sample

of participants: participants were 49.2% male, 33.8 years old on average (SD = 12.0), and had an average of 12.5 years of full-time work experience (SD = 11.1). Participants were paid \$1.00 to complete an online survey that lasted about ten minutes.

Procedure. The study employed a 2 X 2 between subjects design with a fifth condition that served as a floating control condition. Participants in the four treatment conditions were asked to recall and write about someone they had competed against, similar to Study 1a. These instructions were identical across conditions, except for two factors. Repeated competition was varied by asking participants to think of someone they had competed against “just one time (never before and never again)” versus “repeatedly”. Evenly-matched competition was varied by asking participants to either think of a competitor “with whom the competition was quite evenly-matched or closely-decided” or “with whom the competition was not very evenly-matched or closely-decided.” Participants in the control condition were simply asked to think of “someone whom you consider to be an acquaintance.” Thus, one fifth of participants were assigned to recall and write about someone they experienced repeated and evenly-matched competition with, which henceforth will be referred to as the *rivalry* condition.

Participants were then presented with an anagram task, adapted from researchers studying cheating behavior (DePalma, Madey, & Bornschein, 1995; Eisenberger & Shank, 1985). Specifically, they were given three minutes to try to solve a series of four anagrams (CRKO, LABEVE, DSLIE, & FTOEER) on a piece of scratch paper. The first and third anagrams were quite easily solved (ROCK or CORK & SLIDE or IDLES); however, unbeknownst to participants, the second and fourth anagrams had no solution. After this task, participants were

asked to report how many anagrams they had solved, and then responded to a series of questions related to manipulation checks and control variables.

Dependent measure. Consistent with prior research that has employed this task (DePalma et al., 1995; Eisenberger & Shank, 1985), a dichotomous dependent measure of unethical behavior was derived from the number of anagrams participants reported solving. Given that two of the anagrams were unsolvable, participants who reported solving three or four anagrams were classified as misreporting their performance (unethical behavior = 1); those who reported solving two or fewer anagrams were not (unethical behavior = 0).

Manipulation checks. Participants were asked to agree or disagree with the statements “I have repeatedly competed against this person in the past” ($M = 2.98$; $SD = 2.52$) and “This person and I have been evenly-matched in our competition against each other” ($M = 3.59$; $SD = 2.33$) on a scale from 1 (“Not at all”) to 7 (“Very much”). They also completed two items designed to measure feelings of rivalry: “I feel rivalry towards this person” and “I consider this person to be a personal rival” ($\alpha = .87$; $M = 3.00$, $SD = 2.00$).

Control variables. Participants completed the same measures of tangible stakes ($M = 3.66$; $SD = 2.05$) and success ($M = 3.89$; $SD = 2.51$) as in Study 1a, as well as a measure of dislike: “I dislike this person” (1 – “Not at all” to 7 – “Very much”; $M = 2.39$; $SD = 2.00$).⁷

Results

⁷ Participants in the control condition only completed the rivalry and dislike items, as the stakes and success items specifically to the competitive experiences described by participants in the four treatment conditions.

Manipulation checks. Analyses of manipulation checks indicated that our manipulations were successful. Participants asked to recall someone they had repeatedly competed against indicated greater repeated competition than participants asked to recall someone they had only competed against one time ($M = 5.63, SD = 1.82$ vs. $M = 1.35, SD = 1.10, t(98) = 14.64, p < .001$). Similarly, participants asked to recall someone they had been evenly-matched with indicating being much more evenly-matched with their opponent than did participants asked to recall someone they had not been evenly-matched with ($M = 4.92, SD = 2.10$ vs. $M = 2.26, SD = 1.71, t(98) = 6.95, p < .001$).

The results for feelings of rivalry are displayed in Figure 2. An ANOVA indicated significant differences in felt rivalry across condition, $F(4, 110) = 3.89, p = .005$. Participants who thought of acquaintances indicated feeling very little rivalry towards these individuals ($M = 1.83, SD = 1.26$), consistent with the idea that some level of competition is needed for rivalry to exist. Participants who recalled competitors with whom they only competed a single time and with whom the competition was not evenly-matched felt the next lowest level of rivalry ($M = 2.70, SD = 2.04$), followed by participants who recalled a competitor with whom they competed a single time and were evenly-matched with ($M = 2.82, SD = 2.06$). Higher rivalry still was felt by participants recalling a competitor with whom they competed repeatedly but were not evenly-matched ($M = 3.44, SD = 1.67$). Finally, the highest levels of rivalry were felt by participants in the rivalry condition, who recalled competitors with whom they competed repeatedly and were evenly-matched ($M = 4.20, SD = 2.04$). An ANOVA contrast confirmed that rivalry was significantly higher in the rivalry condition as compared to the other three competition conditions, $t(96) = 2.43, p = .017, d = .65, \eta^2 = .077$. Furthermore, in a regression

analysis using a dummy variable to represent the rivalry condition (1; the other three competition conditions were set to 0) and controlling for tangible stakes, success, and dislike, the rivalry condition still significantly outsourced the other three competition conditions, $\beta = .21$, $t(94) = 2.47$, $p = .015$.

As a point of comparison, we also examined participants' expressed dislike for their competitors (or acquaintances) across conditions. Here, an ANOVA revealed no evidence of any differences across condition, $F(4, 110) = 0.41$, $p = .80$, and dislike felt towards repeated and evenly-matched competitors ($M = 2.30$; $SD = 1.90$) was actually non-significantly lower than dislike felt towards simple acquaintances ($M = 2.87$; $SD = 2.23$), $t(110) = 0.82$, $p = .41$. Thus, it seems that the factors of repeated and evenly-matched competition uniquely affect rivalry and not more general dislike.

Unethical behavior. As displayed in Figure 3, participants in the rivalry condition (repeated and evenly matched competition) were far more likely to falsely report their performance ($M = 30.0\%$) than participants in the other four conditions ($M = 7.37\%$), $\chi^2(1, 115) = 8.44$, $p = .01$, $d = .93$. The effect of priming rivalry on unethical behavior was confirmed in a logistic regression analysis while controlling for tangible stakes, success and dislike. Rivalry significantly predicted the misreporting of performance (Wald statistic = 4.46, $p = .035$); success was also significant (Wald statistic = 4.47, $p = .035$), whereas tangible stakes (Wald statistic = .76, $p = .38$) and dislike (Wald statistic = .50, $p = .48$) were not. The odds ratio for the rivalry dummy was equal to 4.35, indicating that the odds of a participant in the rivalry condition misreporting his or her performance were more than four times greater than in the other three competition conditions.

Discussion. Study 2 found that priming participants with rivalry led to significantly greater unethical behavior, as compared to non-rival competition. Specifically, participants in the rivalry condition were more likely to falsely inflate their performance on a cognitive task, which could be seen as analogous to an organization misreporting its financial performance or accounting records. Furthermore, the magnitude of our effect was striking, with participants primed with rivalry being more than four times as likely to misreport their performance than participants in the other conditions. Lastly, we again observed that merely thinking about a rival affected unethical behavior in a domain unrelated to the rivalry, and that neither the tangible stakes of the recalled competitive experience, nor dislike, had any significant effects. This provides additional evidence for the idea that rivalry can activate a mindset that affects subsequent unethical decisions and behavior in a manner different from non-rival competition.

In this study, rivalry was manipulated via a recall task in which the antecedents to rivalry of repeated and evenly-matched competition were varied, and no mention of rivalry was made. Interestingly, unethical behavior was only sparked when participants recalled and wrote about a competitor with whom they had competed repeatedly *and* were evenly-matched with. Unethical behavior across the other conditions was uniformly low. In addition to supporting the link between rivalry and unethical behavior, this study provides causal evidence for the roles of repeated and evenly-matched competition in driving rivalry and subsequent unethical behavior. In combination, these relational factors had a strong positive effect on unethical behavior independent of tangible stakes, success, or dislike. Furthermore, repeated and evenly-matched competition did not predict feelings of dislike, providing evidence for discriminant validity

between rivalry and dislike, and underscoring the importance of competitive history in driving rivalry.

We also conducted a similar study employing the manipulations used in Study 1a and the same dependent variable used here (reporting of performance on an anagrams task). This study replicated the current findings – recalling an experience with a rival led participants to falsely inflate their performance relative to recalling a non-rival competitor. This replication makes us confident that the experience of rivalry increases the tendency to falsely inflate one's performance.

Study 3

Study 3 sought to extend Studies 1 – 2 in three main ways. First, instead of priming rivalry and examining attitudes or behavior in a subsequent, unrelated context, we assessed unethical behavior directed at individuals' rivals. Second, we tested H2 by investigating the role of psychological stakes in explaining the link between rivalry and unethical behavior. Third, we examined rivalry at the organizational level, to see if it would carry similar effects to inter-individual rivalry.

Participants and procedure. Participants were 70 undergraduate students from The Ohio State University in Columbus, OH (55.7% male; $M_{\text{age}} = 21.1$ years; $SD = 1.76$). We selected this institution for study due to its intense rivalry with the University of Michigan. The rivalry dates

back to at least 1897, when the two first met on the football field, and was recently named by the Huffington Post as the #1 inter-university rivalry in the United States.⁸

Participants were recruited via a publicly available list of student clubs and associations (including fraternities and sororities) at the university. Specifically, the officers of these associations were emailed and asked to distribute the survey to their members; for each member that participated, the association received \$5.

Participants completed an online survey described as examining inter-university attitudes between students at four public U.S. universities. Specifically, they were told that they would engage in a joint decision-making task with a randomly-selected student from one of the other universities. Participants were randomly assigned to be paired with a student from the University of California, Berkeley, the University of Michigan, or the University of Virginia. We chose these universities because all of them, including Ohio State, are ranked in the top 16 U.S. public universities, according to U.S. News and World Report; the opponent schools in particular are very closely matched on academic status.⁹ Furthermore, Ohio State had played against UC Berkeley twice in football over the 13 months prior to the survey.

Participants then completed items related to psychological stakes of competition, tangible stakes, and dislike, before completing a decision-making task in which they had the opportunity to lie to their counterpart for personal gain. The survey concluded with measures of demographics and perceived institutional status, as well as manipulation and suspicion checks, and a debriefing.

⁸ http://www.huffingtonpost.com/2011/09/01/the-10-best-college-rival_n_944635.html#s346517&title=Ohio_State_vs

⁹ <http://colleges.usnews.rankingsandreviews.com/best-colleges/rankings/national-universities/top-public>

Dependent measure. Participants played a version of Gneezy's (2005) Deception Game (also see Zhong, 2011) with their counterpart, which was referred to as an "interaction." They were told that the interaction involves two players, an 'advisor' and 'advisee'. The advisee must choose between two options, A and B, that determine payoffs for each party. One of these will pay the advisee \$.80 and the advisor \$.40, and the other pays the advisee \$.40 and the advisor \$.80. However, only the advisor knows which option is which. Participants were assigned to the role of advisor and given a choice of two messages that they could send to their counterpart. The first was true, telling the advisee that "Option A will pay you more than Option B." The other message was a lie, "Option B will pay you more than Option A." The advisor was further told that roughly 80% of people in the advisee role tend to trust the message sent (Zhong, 2011). Thus, participants had a choice between telling the truth and telling a lie for purposes of self-gain.

Psychological stakes. Participants rated their perceived psychological stakes of competition using three items ($\alpha = .82$). First, they were told to imagine that they were going to compete against their counterpart for a \$10 prize rated their agreement with the statement: "The psychological stakes associated with this competition would be very high. That is, separate of any tangible stakes, I would feel that it was very important for me to win." They were also asked to indicate their agreement with the statements: "It is very important to me that my university beats this other university in competitions between the two" and "I want very much for my university to win in competitions against this other university." These items were designed to tap into the psychological desire for victory.

Manipulation Checks. Four items directly assessed feelings of rivalry: “I consider this person to be a rival,” “I feel rivalry towards this person,” “I feel rivalry towards the university that this person is affiliated with,” and “This person is affiliated with a university that is a rival to my own.” Inter-item correlations were very high ($\alpha = .93$), suggesting that feelings of rivalry towards the individual student and his or her university were one and the same.

Control variables. Participants rated their agreement with “The tangible stakes (e.g., money, resources) associated with competitions between my university and this other university are very high.” They rated dislike of the counterpart and associated institution with three items. They were asked to imagine interacted, face-to-face, with their counterpart and rated their agreement with the statement “I would dislike this person,” and also rated their agreement with “I dislike this other university” and “I dislike students, alumni, or other affiliates of this university” ($\alpha = .81$). Finally, we measured participants’ perceptions of the academic and athletic status of each of the universities on a scale from “1 – Low status” to “7 – High status.”

Results. Five participants (7.1%) indicated being suspicious, e.g., “I knew there was no real counterpart.” We present results excluding these individuals; including them does not significantly change our results. Also, because no significant or meaningful differences were observed between participants matched with a counterpart from UC Berkeley versus Virginia, we report results with these conditions combined.

Participants matched with a counterpart from the University of Michigan reported feeling much higher levels of rivalry than participants in the other conditions ($M = 5.70$ vs. 2.52 , $t(63) = 8.83$, $p < .001$). In support of H1, participants in the rivalry condition were far more likely to lie to their counterparts than participants in the other conditions, $M = 50.0\%$ vs. 12.2% , $\chi^2(1, 65) = 11.20$, $p < .001$, $d = 1.09$. This effect held up in a logistic regression analysis (Wald statistic = 4.24 , $p = .040$), when controlling for tangible stakes (Wald = 2.08 , $p = .15$), dislike (Wald = $.00$, $p = .95$), perceived academic status (Wald = 1.04 , $p = .31$), and perceived athletic status (Wald = 1.51 , $p = .22$). The odds ratio for the rivalry dummy was equal to 9.26 , indicating that the odds of participants in the rivalry condition using deception was more than nine times that of participants in the control conditions. We also ran a model in which we examined the interaction between rivalry and dislike; while the rivalry manipulation remained significant (Wald = 4.33 , $p = .038$), neither dislike (Wald = 1.07 , $p = .30$) nor the interaction term was significant (Wald = $.57$, $p = .45$).

We next examined mediation by perceived psychological stakes of competition. Participants matched with a counterpart from Michigan reported significantly higher psychological stakes of competition than participants in the control condition ($M = 5.65$ vs. 4.60 , $t(63) = 2.78$, $p = .007$); further, our measure of psychological stakes positively predicted the use of deception (Wald = 5.39 , $p = .02$). To test for mediation, we used a bootstrapping mediation analysis (Preacher & Hays, 2004), which is now the preferred mediation test, especially for smaller samples (Preacher & Hays, 2004; 2008). A 95% confidence interval for the indirect effect of rivalry on deception via psychological stakes did not include zero $[.011, .617]$, indicating that psychological stakes mediated the relationship between rivalry and unethical behavior, supporting H2.

Discussion. In Study 3, we found that participants were more likely to deceive counterparts from a rival institution than those from a non-rival institution. This occurred independent of dislike, perceived tangible stakes, and perceived academic or athletic status of the counterpart's institution. We also found that the effect of rivalry on unethical behavior was partially mediated by heightened psychological stakes of competition. These results extend Studies 1 and 2 by a) showing an effect of rivalry on unethical behavior directed at the rival; b) showing that rivalry between organizations can have similar effects on individual members' behavior as rivalry at the individual level; c) supporting heightened psychological stakes of competition as a mechanism by which rivalry fosters this willingness to behave unethically for personal gain.

Study 4

In Study 4, we sought to replicate our findings in a real-world context involving meaningful, face-to-face competition. Specifically, we examined rivalry and unethical conduct among professional soccer players in Italy. This setting was well-suited for a test of our hypothesis, for several reasons. First, this is a setting in which fierce rivalries are known to exist. Second, this is a setting with high stakes, for both individual players and teams. Thus, we could be confident that the competitors were fully invested in these contests, and that we were studying a setting in which competitive behavior carried significant consequences. Third, soccer provides a face-valid and accepted measure of unethical behavior, in the form of yellow and red cards, which we describe below.

Setting and sample. Our sample consisted of 2,788 matches played between 2002 and 2009 in Serie A, Italy's top soccer league. Anecdotally, rivalry is known to exist in this league, most often between teams co-located in the same city. For example, Genoa C.F.C.'s coach once described the Genoa derby (intra-city rivalry) between Genoa C.F.C. and U.C. Sampdoria by saying: "The only thing that counts in Genoa is the derby. If you don't win it, it's like robbing a bank and getting out with a suitcase full of rags" (Flamigni, 1995). Serie A includes 20 teams (18 teams in 2002 and 2003), and matches are played between August and May each year. Data on these matches were collected online from ESPN Soccernet, Gazzetta (www.gazzetta.it), Spaghetti Italia (www.spaghetitaliani.com) and <http://digilander.libero.it/>. We first present analyses of these data at the match level (the variables described below are at the match level; correlations between these variables are displayed in Table 1). Then, as a robustness check, we present analyses at the player-match level, which allows for additional player-level controls.

Dependent variables. Our dependent variables were the number of yellow and red cards issued in each match. Yellow and red cards are given to players by referees as punishment for a variety of infractions that are generally related to unsportsmanlike or unethical behavior; yellow cards are given for moderate infractions and red cards for more serious infractions.¹⁰ These can include dangerous tackles that risk injuring other players as well as attempts to deceive the referee by "taking a dive."

Independent variable. To assess rivalry between teams, we created a dummy variable indicating whether teams were located within the same city. Anecdotal evidence suggests that

¹⁰ See the International Federation of Association Football's "Laws of the Game" for more detail: http://www.fifa.com/mm/document/affederation/generic/81/42/36/lawsofthegame_2010_11_e.pdf

co-located teams tend to be fierce rivals ; furthermore, geographic proximity was identified by Kilduff et al. (2010) as the single strongest predictor of rivalry between athletic teams.

Control variables. We collected a variety of control variables that might influence teams' tendencies to receive yellow and red cards. First, we measured the *proximity in standings* between the two teams, as the absolute difference between the two teams' points in the season-long standings.¹¹ We considered this to be a rough measure of the objective stakes of the contest – teams who are closer to one another in the season-long standings generally have more at stake when they play one another because they are vying for ranking within the league standings. Second, we collected *similarity in recent performance*, to account for the possibility that matches between more evenly-matched teams – in terms of how they are currently performing – are objectively more intense, independent of rivalry. This was measured as the absolute difference between the two teams' points earned during their past three matches. It is worth noting that these first two control variables are conceptually similar to two of the antecedents of rivalry, similarity and closely-decided contests, discussed earlier. However, in terms of driving rivalry, the evidence suggests that long-term historical trends along these dimensions tend to outweigh very recent trends like those captured by these control variables (Kilduff et al., 2010). Furthermore, it seems that there is something special about head-to-head contests that are closely-decided which is not captured by similarity in recent performance against third-party opponents (Kilduff et al., 2010). Nonetheless, in addition to the models presented here, we ran all models with these control variables excluded and observed no meaningful differences in the results of our hypothesis tests. (Insert Table 1 about here)

¹¹ Teams earn 3 points for a win, and 1 point for a draw. Season-long standings are the sum of these across all games played, and determine which teams receive bids into lucrative tournaments (high finishers) and which teams are 'relegated' to a lower division (low finishers).

Third, to control for the possibility that yellow and red cards are more common at certain stages of the season – perhaps due to differences in perceived objective stakes – we created two dummy variables (*mid-season* and *late-season*) that indicated which third of the season the match was played in. Fourth, we collected *attendance* data for each match, because it seemed possible that greater fan attendance might promote greater arousal amongst players, perhaps making them more likely to engage in the kind of unethical and aggressive behavior deserving of yellow and red cards. Fifth, twenty of the matches (0.7%) in our sample had no crowd, as a result of disciplinary action against teams and fans. Given the potentially unique atmosphere of these matches, we created a dummy variable (*no crowd*) as a control. Sixth, we measured the absolute margin of victory in the match (*goal differential*), as more closely-decided matches might foster greater arousal and aggressive play. Seventh, we measured referees' propensity to issue yellow and red cards, as equal to the average number of cards (yellow or red, depending on the analysis) that each match's referee had issued across all matches he had refereed up to that point in the season (*avg. # of cards given by referee*).¹²

Results. In terms of simple means, the average number of yellow cards issued to players was significantly higher in rivalry matches as compared to non-rivalry matches, $M = 6.03$ vs. $M = 4.25$, $t(2786) = 6.12$, $p < .001$, $d = .91$, eta-squared = .013. We next ran a Poisson regression analysis that included our control variables. As shown in Model 1 of Table 2, the positive relationship between the rivalry dummy and the frequency of yellow cards was positive and significant, Wald $\chi^2 = 40.23$, $p < .001$. Red cards were also more common in rivalry matches

¹² We ran additional models in which we controlled for referees' averages for the entire season, regardless of when the game was played. This did not result in any meaningful differences in results.

than non-rivalry matches, $M = .50$ vs. $M = 0.33$, $t(2786) = 1.90$, $p = .057$, $d = .27$, eta-squared = .001; as shown in Model 2, this held up in a Poisson regression with controls, Wald $\chi^2 = 8.15$, $p = .004$. (Insert Table 2 about here)

To address concerns over a lack of independence within these data, we also ran these models with team-level fixed effects (dummy variables) included for both the home and away teams. This served to control for any team-level tendencies toward earning yellow and red cards, as well as eliciting them from opponents. The results were not meaningfully different: rivalry was still associated with higher rates of yellow (Wald $\chi^2 = 35.97$, $p < .001$) and red cards (Wald $\chi^2 = 4.24$, $p = .039$). Thus, H1 was supported.

As an additional robustness check, we conducted similar analyses at the player-match level of analysis, which allowed us to control for a number of other factors that varied at the player-match and player levels. These included: player position (goalkeeper, defender, midfielder, or forward), minutes played in the match, whether or not the player was a substitute, the average number of yellow (or red) cards that player had received up to that point in the season, and whether the player was playing at home or away. Our sample for these analyses consisted of 100,310 matches played by individual players between 2002 and 2009 (the same sample of matches used for match-level analyses).

We ran two logistic regression analyses predicting whether or not a player earned a yellow or a red card in a given game, with all match-level, player-level, and player-game level control variables included. In the model for yellow cards, rivalry was positively and significantly

associated with likelihood of earning a yellow card, Wald statistic = 54.27, $p < .001$, odds ratio = 1.73. The logistic regression for red cards yielded a Wald statistic for rivalry of 9.12, $p < .01$, and odds ratio of 1.99.

Discussion. In Study 4, we found that professional soccer players were more likely to be penalized for unsportsmanlike behavior when playing against rival teams, as compared to matches against other teams. Supporting the idea that rivalry promotes unethical behavior independent of more objective or stakes-based drivers of competitive intensity, these effects held when controlling for proximity between teams in the season standings, proximity between teams in recent performance, and the margin of victory in the match. These findings are consistent with the results of Studies 1 – 3, and suggest that the positive influence of rivalry on unethical behavior extends outside of the laboratory into real-world, high-stakes competitive arenas, thus boosting the generalizability and external validity of our findings.

There are, however, some limitations to Study 4 that are worth noting. First, our measure of rivalry was indirect and may not have captured all of the rivalries existing in the Serie A league, as there are apt to be some pairs of rival teams that are not co-located. However, this should have worked against finding a significant difference between matches classified as rivalry versus non-rivalry. Second, although yellow and red cards are fairly face-valid measures of unethical behavior, they are occasionally issued for behaviors that are less directly unethical (e.g., taking one's jersey off after scoring a goal). Third, yellow and red cards are based upon subjective judgment calls by referees, so one possible alternative explanation for our findings could be that referees are more likely to penalize players in rivalry matches, even if their behavior is not any

different. The plausibility of this explanation, however, is reduced by the fact that referees are extensively trained on what constitutes a punishable offense and are expected to maintain consistent standards across matches. Moreover, their performance is closely monitored to determine promotion to international competitions versus demotion to lower leagues. Fourth, although we controlled for proximity in league standings as a rough measure of the objective stakes of the contest, this is not a perfect measure, so we cannot definitively rule out objective stakes as a possible alternative explanation. Overall, as is the case with all archival studies, we are constrained in our ability to make causal inferences; however, the consistency in results between this archival study and the three experimental studies increases our confidence in the causal link between rivalry and unethical behavior.

GENERAL DISCUSSION

Despite substantial anecdotal evidence of its power to influence behavior, the topic of rivalry has received scant scientific scrutiny. In the current research, we compared rivalry to non-rival competition in terms of their consequences for unethical behavior. Across multiple studies, involving adults from the general population, undergraduates and professional athletes, we observed that rivalry promoted greater unethical behavior than non-rival competition, independent of tangible stakes, supporting H1. This was true across multiple manipulations of rivalry and multiple measures of unethical attitudes and behavior. These results are summarized in Table 3. We also found evidence supporting the role of increased psychological stakes in differentiating rivalry from non-rival competition, and in explaining rivalry's positive effects on unethical behavior, supporting H2. When competing against their rivals, individuals place

greater subjective importance on competitive outcomes, above and beyond whatever tangible stakes are present, and this leads them to be more willing to engage in unethical behavior that can confer an advantage. Furthermore, we observed in Studies 1 – 2 that exposure to rivalry increases unethical behavior in subsequent, unrelated domains, consistent with the idea that considering rivals activates a rivalry mindset that can influence subsequent decisions. Finally, in Studies 1b and 2, we observed causal evidence for the roles of repeated and evenly-matched competition in the formation of rivalry between individuals. (Insert Table 3 about here)

Theoretical Contributions

This research makes several theoretical contributions. First, we conceptualize and investigate rivalry as something distinct from traditional conceptions of competition. In doing so, we both extend prior research on competition, and increase understanding of an apparently powerful, yet largely unstudied phenomenon: the subset of competition involving rivalry. We find that rivalry and non-rival competition have systematically different consequences – rivalry exerts a greater positive influence on unethical behavior than does non-rival competition. Although a small body of prior work has linked rivalry to increased effort, our research suggests that it may be a double-edged sword that can also push individuals to pursue success in less ethical ways. Furthermore, we find evidence that rivalry is associated with increased psychological stakes, consistent with the conceptualization used here and elsewhere (Kilduff et al., 2010), and that this helps explain why rivalry fosters increased unethical behavior. Our results also suggest that rivalry is quite common. Participants who were asked to recall and write about a personal rival were apparently able to do so without much effort. This included both university students as well as adults from

the general population. Furthermore, in Study 2, we were able to incite feelings of rivalry between participants via a relatively brief sequence of simulated competitions that contained two antecedents of rivalry – repeated and closely-decided competition. These findings suggest that rivalry is a widespread psychological phenomenon, not one that is restricted to athletic contexts or to hypercompetitive individuals and environments. Indeed, we found causal evidence for repeated competition and evenly-matched past contests as reliable antecedents to rivalry between individuals, extending existing correlational results from athletic teams (Kilduff et al., 2010).

It is also notable that in Studies 1 – 2, priming rivalry affected participants' subsequent attitudes and behavior in unrelated settings. It seems that just thinking about a rival can be enough to activate a rivalry mindset, which can then guide behavior in situations unrelated to the rivalry itself. Two important implications follow from these results. First, they suggest that the influence of rivalry is apt to extend beyond instances of direct competition between rivals. Small, everyday cues that activate memories or thoughts about a rival may be sufficient to alter behavior, even in domains unrelated to the rivalry. For example, a manager who reads about a rival company in the news, or runs into an old high school rival at the country club, might be subsequently more likely to submit a false earnings report, or to mislead a business partner during a negotiation. Second, these results suggest that rivalry, rather than simply serving as an input to rational cost-benefit analyses, fosters unethical behavior in a more automatic and less conscious manner (although our results do not preclude conscious processing from also occurring). This is consistent with a growing body of research documenting the importance of automatic and hot processes in driving ethical decisions (e.g., Haidt, 2001). Further, it is worth noting that, across studies, our measures of tangible stakes did not relate to unethical behavior in

the manner that rivalry did. This provides additional evidence that rivalry does not simply magnify objective stakes, which then factor into cost-benefit analyses. Overall, our results suggest that rivalry may be a particularly important determinant of unethical behavior, and add to the growing body of research indicating that unethical behavior is often a product of more automatic processes.

The second broad contribution of this research is in identifying a previously unexplored determinant of unethical behavior, thus helping scholars to better understand when and why actors behave unethically. In addition to highlighting the role of rivalry in promoting such behavior, our findings also shed light on the conditions under which competition is generally more or less likely to lead to unethical behavior. It seems that competition is apt to foster greater unethical behavior when it occurs amongst longstanding and evenly-matched opponents than amongst unfamiliar or anonymous ones.

Third, our findings highlight the importance of taking a relational approach to the study of both competition and unethical behavior. As discussed, competition has traditionally modeled in objective, structural terms; similarly, research on unethical behavior has generally focused on individual and situational characteristics (e.g., Kish-Gephart et al., 2010; although see Gino, Ayal, & Ariely, 2009 & Gino & Pierce, 2010). Going forward, in order to better understand competition – between individuals, groups, and organizations – researchers should account for prior interactions and existing relationships. Seminal work on cooperation between organizations demonstrated that accurate prediction of alliance formation requires taking into account past interactions and trust (Gulati, 1995); competition research is apt to benefit from a

similar perspective. Likewise, our understanding of when and why people engage in unethical behavior may be increased by considering the relationships and histories they have with those around them, and in particular, with those who are affected by their behavior. Such relational approaches would dovetail with a broader relational trend within organizational research, which has included topics such as job design (Grant, 2007), demography (Tsui & O'Reilly, 1989), negotiations (Gelfand et al., 2006) and job attitudes (Wrzesniewski, Dutton, and Debebe, 2003).

Organizational and Practical Implications

Our findings also suggest a range of important organizational and practical implications. Most generally, competition is everywhere in the business world, and it often occurs between familiar and longstanding opponents, or rivals. It is important to recognize that this may be a uniquely intense form of competition that varies substantially from anonymous 'perfect market' competition; assuming that the two are the same could result in serious miscalculations and predictions about one's own, and one's opponents', behaviors. More specific to the findings documented here, unethical behavior is costly and destructive, and preventing it has become one of the primary applied goals of organizational research. Given the apparent role of rivalry in promoting unethical behavior, organizations and managers should carefully consider how organizational structures and policies may influence feelings of rivalry within employees. For instance, managers concerned with unethical behavior may want to design jobs, incentives, and promotion systems to avoid the antecedents of rivalry such as repeatedly pitting employees against each other, as many sales, legal, and financial firms are known to do. The upside may be increased motivation (Kilduff et al., 2010), but the downsides may be very real as well.

Organizations might also be wary of placing too much emphasis on outperforming rival companies, lest this foster a culture of rivalry that prioritizes performance at the cost of ethical business practices. An acquaintance of the first author who interned at Microsoft in the late 1990s described how the company hung punching bags with pictures of the Linux penguin on them and distributed hats that said “We put the NO in Nokia.” These would seem to be perfect ways of priming rivalry amongst employees.

In addition to considering the consequences of rivalry within employees, managers should also be wary of their own propensity to be influenced by it. Top management teams and boards of directors may want to take explicit measures to guard against rivalry influencing their strategic and moral judgments, such as relying on objective data and decision criteria, and soliciting the opinions of outsiders. Overall, given its potential benefits and downsides, organizations are faced with important decisions about how to best manage rivalry. Future work should examine whether certain organizational factors, such as culture, incentives, and leadership, may allow organizations to harness the benefits of rivalry while simultaneously avoiding its downsides. The consequences of rivalry may also differ across different job settings and job characteristics. For instance, jobs for which performance is effort-based and autonomy is limited – thus limiting the opportunity for unethical behavior – may tend to benefit from rivalry more than jobs that offer freedom in decision-making.

Future directions

There are a number of potential avenues for research that would extend the current work. First, future work should examine unethical behavior at the organizational level. Although Studies 3 and 4 involved rivalry between organizations, these were not traditional for-profit businesses, and the unethical behavior was still perpetrated by individuals. Theoretically, there is reason to believe that our results will generalize to organizations – a range of organizational outcomes have been successfully predicted by psychological theory that treats the organization as an individual (e.g., Cyert & March, 1963; Greve, 1998; Zajac & Bazerman, 1991), and the strategy, structure, and culture of organizations are often determined by a few key individuals in positions of power (Cho & Hambrick, 2006; Hayward & Hambrick, 1997; Kaplan, 2011; Miller & Dröge, 1986; Resick, Whitman, Weingarden, & Hiller, 2009; Staw & Sutton, 1992). Future research, however, should investigate this empirically – for instance, examining the role of rivalry in promoting accounting fraud. In such research, inter-firm rivalry might be measured via expert survey responses, text analysis of media reports, or measures that tap into the antecedents of rivalry, such as repeated competition (e.g., quantity of competitive moves exchanged or tenure in the same industry). To control for more objective competitive pressures and stakes, one could collect measures of market overlap and resource similarity (Chen, 1996).

Second, research should explore additional consequences of rivalry besides motivation and unethical behavior. In particular, by magnifying the psychological stakes of competition, rivalry could lead to a range of suboptimal or financially irrational behaviors. First, actors who derive subjective payoffs from outperforming rivals might be more likely to focus on relative performance as opposed to absolute performance – that is, adopt a ‘competitive’ social value orientation (Messick & McClintock, 1968). In turn, they may be willing to sacrifice their own

gains in order to limit those of a rival. In a related vein, actors might be unwilling to cooperate with their rivals (e.g., pursue joint ventures) even when it is beneficial to do so. Second, rivalry might create such a strong reluctance to concede defeat that competing actors escalate commitment to losing competitive endeavors instead of abandoning them (e.g., Staw, 1976). For instance, rival firms might continue investing in underperforming product lines rather than cutting their losses and exiting the market. Third, given conditions of limited attention and cognitive resources (e.g., Cyert & March, 1963), actors engaged in fierce rivalries might overlook non-rival competitors. In other words, rivalry could lead to a form of tunnel vision or myopia in which actors are so preoccupied with their rivals that they become vulnerable to other competitive threats.

Third, as alluded to above, future research should investigate whether rivalry can be diminished or extinguished, and whether it is possible to harness the benefits of rivalry while avoiding the pitfalls. For example, perhaps cooperation amongst rivals, even if forced upon them by authorities or regulatory bodies, could diminish the rivalry between them (e.g., Sherif, Harvey, White, Hood, & Sherif, 1961). Another intervention that could work at the individual level might be self-affirmation – numerous studies show that allowing individuals to affirm their sense of self can reduce a host of biases (Cohen & Sherman, 2006). Alternatively, rivalry might be particularly persistent, and thus resistant to intervention. Conducting these studies will go a long way towards understanding how virulent the effects of rivalry are apt to be.

Fourth, further research should further investigate the potential for an interaction between rivalry and dislike. Anecdotally it seems as though rivals can sometimes be people or organizations we

like and respect, and sometimes those we truly dislike. Do both types of rivalry carry the same consequences? In Study 3, we found no interaction between rivalry and dislike; thus, students who felt positive affect towards the rival institution were still just as likely engage in deception. However, it is possible that more extremes forms of unethical or antisocial behavior – such as direct aggression or sabotage – might require both dislike and rivalry to occur.

Conclusion

Competition is ubiquitous, among individuals, groups, and organizations. When competing, actors face a variety of decisions about how to behave, how to compete, and how to attempt to increase their chances of victory. The relationships, and in particular the rivalries, that exist between actors can affect these decisions. Our work suggests that actors who feel rivalry are more likely to engage in the kind of behavior that has come to define the ugly side of competition, such as deception, cheating, and sabotage. These results paint rivalry as a powerful motivational and corruptive force with significant implications for organizations.

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Table 1

Correlations between match-level variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Yellow cards											
2. Red cards	.183***										
3. Rivalry (0 or 1)	.115***	.036†									
4. Proximity in standings	.085***	.047•	.001								
5. Similarity in recent performance	.010	-.015	.002	.286***							
6. Mid-season (0 or 1)	.010	-.015	-.035†	-.055**	-.102***						
7. Late-season (0 or 1)	-.056**	-.010	-.02	-.384***	.003	-.481***					
8. Attendance (in thousands)	-.060**	-.039•	.268***	-.125***	-.046•	-.031	.024				
9. No crowd (0 or 1)	-.003	-.004	-.011	-.027	-.047•	.042•	-.023	-.121***			
10. Goal differential	-.133***	.029	-.007	-.054**	-.038•	.010	-.032	.114***	-.007		
11. Avg. # of yellow cards given by referee	.143***	.019	.040•	-.056**	-.051**	.032†	.073***	.057**	-.001	.036†	
12. Avg. # of red cards given by referee	.047•	-.007	.006	-.016	-.034†	.024	.016	-.004	.001	.015	.411***

† $p \leq .10$; • $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$, two-tailed tests.

Table 2

Poisson Regression Analysis Models of Yellow and Red Cards*

Variable	Model 1	Model 2
	Yellow cards	Red cards
Rivalry (0 or 1)	0.408*** (0.064)	0.642** (0.225)
Proximity in standings	0.003* (0.001)	0.011* (.004)
Similarity in recent performance	-0.002 (0.005)	-.032† (.017)
Mid-season (0 or 1)	-0.0146 (0.023)	-0.046 (.084)
Late-season (0 or 1)	-0.059* (0.025)	0.027 (0.090)
Attendance (in thousands)	-0.002*** (0.001)	-0.006** (0.002)
No crowd (0 or 1)	-0.065 (0.111)	-0.212 (0.413)
Goal differential	-0.056*** (0.009)	0.063* (0.030)
Avg. # of cards given by referee	0.076*** (0.010)	-0.08 (0.168)
Log likelihood	-5761.51	-2061.94
Likelihood ratio χ^2	167.84***	25.87**

N = 2788 matches.

† $\leq .10$; * $\leq .05$; ** $\leq .01$; *** $\leq .001$, two-tailed tests.

* Standard errors are in parentheses.

Table 3

Rivalry vs. Non-rival Competition: Summary of Findings*

	Study 1a Machiavellianism	Study 1b Machiavellianism	Study 2 False reporting of performance	Study 3 Deception	Study 4 Yellow cards	Study 4 Red cards
Non-rival competition	46.3 (8.52)	47.4 (7.88)	7.5%	12.2%	4.25 (1.95)	0.33 (0.60)
Rivalry	51.0 (7.20)	50.6 (7.43)	30%	50%	6.02 (1.99)	0.50 (0.96)
Test of difference in means	$t = 2.94^{**}$	$t = 2.74^{**}$	$\chi^2 = 7.67^{**}$	$\chi^2 = 11.21^{**}$	$t = 6.12^{***}$	$t = 1.90^\dagger$

$^\dagger \leq .10$; $\bullet \leq .05$; $\bullet\bullet \leq .01$; $\bullet\bullet\bullet \leq .001$, two-tailed tests.

* Means by condition are displayed; standard deviations are in parentheses.

Study 4 non-rival competition includes three competition conditions besides repeated and evenly-matched.

Figure 1. Study 2: Average rivalry felt by condition.

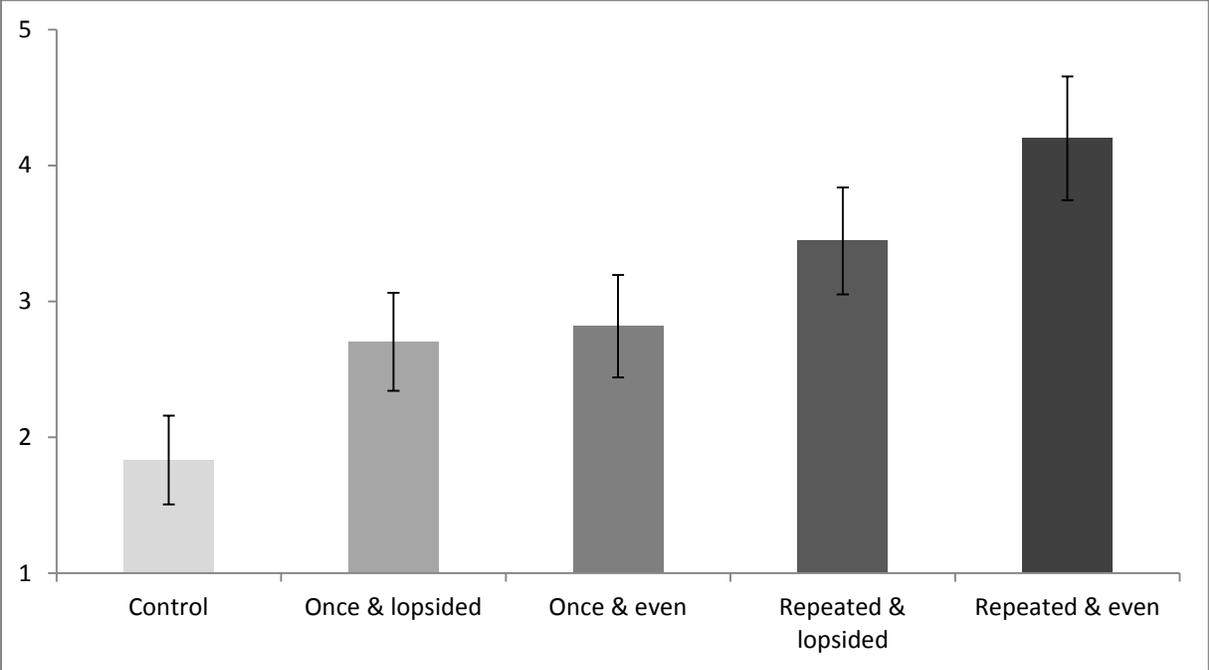


Figure 2. Study 2: False reporting of performance by condition.

