Competition and Unethical Behavior
Utilizing State Competitiveness to Reduce Cheating in Contests Among Employees

Dissertation

zur Erlangung des Grades

Doktor der Wirtschaftswissenschaft (Dr. rer. pol.)

der Juristischen und Wirtschaftswissenschaftlichen Fakultät
der Martin-Luther-Universität Halle-Wittenberg

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März 2020

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Verteidigt am 9. Juli 2020

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CHAPTER 1

Introduction

Competition among employees plays an important role in many companies (Cowgill, 2015). At its extreme, companies may implement a forced distribution rating system, often referred to as forced ranking (Adsit, Bobrow, Hegel, & Fitzpatrick, 2018; Grote, 2005; Hazels & Sasse, 2008). It refers to a performance management tool entailing that managers must rank their subordinates based on (annual) performance evaluations (Hazels & Sasse, 2008). This kind of performance management was made famous particularly by Jack Welsh, who served as General Electric's (GE) CEO between 1981 and 2001 and who was a strong advocate of forced ranking. During Welch's years as CEO, GE's workforce decreased from 404,000 to 313,000, while the company profitability increased tremendously (Bartlett & Wozny, 2005). At GE, the forced ranking system meant that every manager had to rank his employees into five and later three categories: the top performers (20%), who would be promoted and rewarded with bonuses, the poor performers (10%), who would eventually be laid off, and the rest (70%) who would be developed as much as possible (Bartlett & Wozny, 2005). Many other large companies, such as Microsoft or Ford, implemented some variant of the system (Olson, 2013).

Note that the forced ranking system in its extreme is compatible with the American work culture much more than with European culture. While at-will employment is a dominant concept in the United States, German legislation would not allow dismissal based on a low relative performance (Maaß, 2013; Stone, 2007). But even in the US forced ranking

appears to become less prevalent—many companies announced that they stopped using forced ranking systems (Olson, 2013). A reason for this could be the growing evidence pointing to substantial disadvantages of the system, such as increased sabotage among the competing employees or increased legal risks for the company (Berger, Harbring, & Sliwka, 2013; Giumetti, Schroeder, & Switzer, 2015). Accordingly, the more recent literature on forced ranking is rather critical about the concept (cf. Adsit et al., 2018).

But even if employees at the lower extreme of the performance curve are not automatically laid off anymore, competition among employees continues to play an important role. In a survey among 15,540 Americans, 41.6% indicated that their last wage increase was due to a performance advantage compared to their colleagues (Cowgill, 2015). In a similar survey, three quarters of respondents indicated that promotion slots would be limited, even if all workers performed well (Cowgill, 2015). The survey results suggest that promotion is often depending on how the employee performs in comparison to her colleagues. This claim is in line with results based on a survey among 2,827 company representatives who were responsible for awarding the promotions to employees (DeVaro, 2006). In the scientific literature, the described situation is often referred to as *promotion tournaments* (Chen, 2003). Another form of competition often found particularly among sales force is the *sales contest* (Poujol, Harfouche, & Pezet, 2016). Such contests are more clearly delineated with respect to start and end time as well as the evaluation of task performance (e.g., number of sold units).

Be it in the form of sales contests or promotion tournaments, competition between employees is usually implemented for its motivating effects (Chan, 1996; Lazear & Rosen, 1981). It should be noted, however, that the motivating effect of competition is not undebated. A meta-analysis suggests that competition elicits so-called approach and avoidance goals, where the former are associated with performance increments, while the latter are associated with performance decrease (Murayama & Elliot, 2012).[1] On the other hand, there is research suggesting that competition is motivating higher effort and enhances performance even in the absence of material prizes (Charness, Masclet, & Villeval, 2014; Hannan, McPhee, Newman, & Tafkov, 2012). Contests can stimulate effort even in cases where status is unlikely to change because the contest's outcome is not made public (Tafkov, 2013). What is it then about competition that makes people exert that extra effort?

[1] Note that performance is the result of abilities and effort. As effort cannot be measured objectively, empirical research usually assesses performance. But as abilities are assumed to be stable over the course of an experiment, any differences in performance are ascribed to differences in effort (Fletcher, Major, & Davis, 2008).

Behavior in contests is often explained with the social comparison theory (Festinger, 1954). This classic theory suggests that people have a need for accurate self-evaluations. To attain such evaluations, they engage in social comparisons, i.e., they compare their abilities with the abilities of other people in their social surroundings. But people do not only want to know where they stand. Instead, there is a drive to improve, something that Festinger (1954) calls the "unidirectional drive upwards" (p. 124). In line with that idea, it is argued that people increase their efforts in contests because they want to increase (or defend) their social status (Charness et al., 2014). Status is granted if the contest is won, hence, people are motivated to win contests. As a consequence, they exert effort and thereby increase performance—an effect that is utilized by employers when they establish contests such as promotion tournaments among their employees.

But high effort is not the only way to win a contest. Employees may be tempted to employ illegitimate ways of gaining an advantage or imposing a disadvantage onto another contestant (Lazear & Rosen, 1981; Murphy, 2004). Taking an illegitimate advantage in contests is often referred to as cheating, while behaviors that illegitimately disadvantage a competitor are referred to as sabotage (Preston & Szymanski, 2003). It is important to note that sabotage and cheating are used here as categories rather that specific behaviors. I will provide an example for each of the two categories in the following, however, very different kinds of behavior may appear suitable to employees in different situations.

A controversial article appearing 2015 in the New York Times provides an example for sabotage among employees at Amazon (Kantor & Streitfeld, 2015)[2]. Amazon had a so-called "Anytime Feedback Tool" in place, which enabled employees to send comments about other employees right to their supervisor. Identities of the colleagues who provided the feedback were typically not disclosed to the targeted colleagues. According to the authors, many employees "described feeling sabotaged by negative comments from unidentified colleagues with whom they could not argue". This is attributed to the fact that "team members [were] ranked, and those at the bottom eliminated every year" (Kantor & Streitfeld, 2015). More examples of sabotage in contests are discussed by Chowdhury and Gürtler (2015).

[2] The article sparked a debate in which Amazon CEO Jeff Bezos and Amazon employees renounced the culture as it was described in the article by Kantor and Streitfeld (2015; Streitfeld & Kantor, 2015).

While sabotage is directed at others, cheating comprises activities intended to inflate the indicator of one's own performance. Hampton (1970) describes a case in which salespeople were asked to acquire new subscribers for a newspaper. Some of the solicitors persuaded non-English speaking people to order the newspaper, knowing that those people would fail to pay for the newspaper and most likely rescind the contract. Another common way of inflating one's sales score is to post or predate orders so that they fall into the evaluated period (Moncrief, Hart, & Robertson, 1988).

Comments from people who participated in my research corroborate the temptation of employing unethical behavior to increase one's chances for a high rank. When asked about how they would feel about a contest where the possible prize was a large pay raise one respondent wrote "I'd probably be willing to engage in illegal activity for such a large raise. Easily."

Note that none of the examples for sabotage and cheating in contests excludes the motivating role of the prize. In the Amazon example, the prize might have been a potential bonus or, for some employees, not being dismissed after the next annual performance review. In the newspaper solicitation contest the winner prize was an increased commission rate for the contest period. As there were significant prizes at stake, any behavior can be attributed partly to the desire for the prize. Likewise, the unethical behavior from the examples can be attributed in part to the actors' desire for the prize, and not solely to the potential status increase or pure joy of winning (Dohmen, Falk, Fliessbach, Sunde, & Weber, 2011). In these examples, thus, it is not possible to disentangle the "pure" effect of competition from the effect of the prize (Charness et al., 2014).

At this point, it may be asked, why are cheating and sabotage unethical? The first reason is that both behaviors violate the widely agreed upon fairness norm (Clarke & Aram, 1997). Cheating and sabotage are intended to generate a non-justified advantage of the actor or disadvantage of the victim, respectively. In both cases—cheating and sabotage—the other competitors become victims, particularly the ones who compete in a norm-conforming manner.

Moreover, the occurrence of sabotage has a negative effect on overall productivity, because employees who are being sabotaged exert less effort or refrain from participating in the contest altogether (Münster, 2007). In addition, as sabotage is usually directed at the best contestants (Vandegrift & Yavas, 2010), those contestants refrain from expending their full potential to prevent being identified as a strong competitor and hence being sabotaged (Gürtler, Münster, & Nieken, 2013). In an experiment by Carpenter, Matthews, and Schirm

(2010), the possibility to sabotage competitors decreased the overall performance to levels even lower than achieved in the absence of competition (i.e., piece rate remuneration). In an organization context, where contestants are employees who generate output, thus, sabotage has direct negative economic effects (for a review, see Chowdhury & Gürtler, 2015).

In contrast to sabotage, cheating does not necessarily imply a direct victim, and may therefore appear less harmful. Gilpatric (2011) argues that employees who are cheating have negative effects on the organization only when their behavior is detected. This may be true for bribery—for example, when an employee bribes an official to gain a contract. The victims of such behavior are all outside the bribing organization (competing companies, the general public, etc). However, if we understand cheating as a category of all behavior that is aimed at illegitimately improving one's rank, negative economic consequences for the employee's organization are easily conceivable, as well. Think of the example in which salespeople had the task of acquiring new subscribers for a newspaper and closed deals with people of whom they knew that they would not pay for the subscription (Hampton, 1970). The example illustrates how customer relations may deteriorate if salespersons focus solely on winning contests (Poujol & Tanner, 2010). Eventually, dissatisfied customers will result in profit loss. Depending on the nature of the particular cheating activity, the detection of it may be associated with serious legal consequences and it might pose a threat to the company image (Shi, Connelly, & Sanders, 2016). Once more, think of a manager engaging in bribery in order to win against his colleagues (Tackett, 2010). There are well-known examples of companies who had to pay a high price for its cheating employees. Siemens, whose corruption scandal unfolded in 2006/2007, had to bear costs of around $2.5 billion (Crane & Matten, 2010). To summarize, sabotage and cheating in contests are unethical for violating the fairness norm and for impeding efficiency.

The previous few paragraphs highlight three aspects that, taken together, yield the relevance of the research gap that this dissertation aims to address. First, I argued that sabotage and cheating in contests are illegitimate behaviors and generally undesired by contest organizers. Second, research suggests that contestants engage in sabotage and cheating in order to rank high or win a contest. Third, contests between employees are ubiquitous in many organizations. Taken together, these three premises allow deducing the need for measures to mitigate unethical behavior in contests—and this is the research gap that I will address in the present dissertation. Put differently, the goal of this dissertation is to find a way of mitigating unethical behavior in contests.

In further specifying the research goal, I could focus on persons or situations (Treviño, 1986). Let me consider focusing on persons for a moment: experimental research suggests that there is a stable number of people who do not cheat—even when incentives reward cheating and the behavior is undetectable (Fischbacher & Föllmi-Heusi, 2013). We may thus ask, who are the people employing unethical behavior in contests? From a practical point of view, however, answering the question has limited value. Identifying certain persons as prone to acting unethically in contests does not help reduce unethical behavior—person characteristics are by definition stable and not readily changed by interventions (Hamaker, Nesselroade, & Molenaar, 2007).

Taking situations into account appears to be the more fruitful approach: the questions then become, when, or under what circumstances do people engage in unethical behavior, and how can we control those circumstances to reduce unethical behavior? It should be noted that unethical behavior can always be reduced by installing policies that weaken the benefits or raise the costs of the respective behavior (Chowdhury & Gürtler, 2015). For example, the likelihood of getting caught could be increased by realizing regular audits, or a company could increase the immanent punishment for cheating (Gilpatric, 2011). These general strategies are applicable to any context and will therefore not be the focus of my research. Instead, this dissertation targets the particularities of contests, how they contribute to unethical behavior, and how they may be controlled in order to mitigate unethical behavior. In more practical terms, the overarching research question thus becomes, how must contests be designed so that they stimulate more ethical behavior? This research question will be addressed in three papers. What follows in the remainder of this introduction is a motivation and summary of the three papers.

The first paper (i.e., Chapter 2) is a literature review taking stock of the empirical evidence for the antecedents of unethical behavior in contests. The paper establishes the key concepts of this dissertation and lays the theoretical foundations for the following two papers. The second paper (i.e., Chapter 3) takes up the concept *state competitiveness* from the literature review and develops it into a measurable construct. The paper then reports the development of an instrument for measuring state competitiveness. Finally, the third paper (i.e., Chapter 4) utilizes the instrument to study the extent to which state competitiveness can explain unethical behavior in contests. Furthermore, the paper reports a new method to reduce cheating in contests by taking advantage of state competitiveness.

1. Reviewing the empirical literature on unethical behavior in contests (Ch. 2)

The study of competition has a long tradition in various fields, including economics and psychology. In economics, a prominent concept is the competition that characterizes the relation of businesses on the market. In contrast, the present work focuses solely on interindividual competition, that is, competition between persons, or more specifically, employees. Interindividual competition plays an important role in various contexts and it is hence studied in different domains; mainly sports, education, and labor market (Niederle & Vesterlund, 2011). As diverse as the backgrounds of competition research are the methods employed to study it. Traditional economics study competition with theoretical models, while more recent behavioral economics approaches invite people to participate in laboratory experiments. In such experiments, participants work on real or chosen effort tasks and are remunerated in a way that establishes competition among each other. Moreover, there is a considerable part of competition research that asks study participants to imagine a specific contest and then report how they would act in the envisioned situation (e.g., Mudrack, Bloodgood, & Turnley, 2012).

The study of unethical behavior as a consequence of competition is nothing new, either. For example, Hampton (1970) describes cases in which competition between employees leads to unethical behavior. Lazear (1989) lays out how competition among colleagues may cause them to sabotage each other. And more recently, researchers started to study the adverse effects of tournament compensation empirically in laboratory experiments (Harbring & Irlenbusch, 2005; Harbring, Irlenbusch, Kräkel, & Selten, 2007). These experiments typically manipulate elements of the contest to demonstrate how these factors determine sabotage activities of the contestants. A different stream of literature investigates the role of individual factors such as competitiveness on unethical behavior in contests (Terpstra, Rozell, & Robinson, 1993).

However, despite a considerable body of research on the relation of competition and unethical behavior, it proves to be problematic to integrate the individual findings from the studies into a single picture. To a large extent, this is due to a lack of clarity of concepts and terms related to competition. While there is a rich and varied literature on the topic, it is grounded in different fields that use distinct terminology. For example, the term "competition" is sometimes used synonymously with "contest" (Hanek, Garcia, & Tor, 2016), but it may also refer to the number of competitors (Cartwright & Menezes, 2014), or the broader idea of vying for limited resources (Schreck, 2015). As the same terms are used

to refer to different concepts, and as different terms are used to refer to the same concept, it is difficult to get an overview of what we know about unethical behavior in contests. A common language is necessary to disentangle and re-integrate those terms and concepts. Therefore, Chapter 2 includes the establishment of a clear terminology, so that each concept is associated with one term.

Furthermore, the literature review in Chapter 2 yields a framework of competition and unethical behavior that helps integrating the findings of the different studies into a larger picture. The framework is based on a traditional person–situation interactionist account of behavior, and represents behavior as the result of interactions between the person with its environment (Treviño, 1986). More specifically, reviewing the empirical literature yields five elements: attributes of the contest, attributes of the person, attributes of the situation, the actor's affective state, and the outcome—unethical behavior. The fourth category—affective state—will play a key role in the remainder of this dissertation. The category includes a concept that I will call state competitiveness. In the following section I will argue for its key role in determining unethical behavior in contest. But empirically testing this idea demands a reliable and valid way of measuring state competitiveness. Accordingly, the following chapter includes the theoretical development of the concept sate competitiveness as well as an instrument to measure it.

2. Conceptualizing and measuring state competitiveness (Ch. 3)

In this section I will argue that two-dimensional state competitiveness can explain under which circumstances people compete by conforming to the rules and when they employ unethical behavior to win. Empirically investigating the role of state competitiveness demands a reliable method of measuring state competitiveness. As such an instrument does not yet exist, I develop a brief self-report instrument in a series of studies reported in Chapter 3. But first, let me take a step back and explain the concept state competitiveness and the rationale behind its link to unethical behavior in contests. A well-founded establishment of two-dimensional state competitiveness is necessary because—with a few exceptions—this concept has not been described before (cf. Hartmann & Schreck, 2018; Malhotra, 2010).

The term "competitiveness" broadly refers to the extent to which someone likes competing or being in contests (Bönte, Lombardo, & Urbig, 2017). More differentiated accounts of competitiveness suggest that it contains two dimensions (Houston, McIntire, Kinnie, & Terry, 2002; Ryckman, Libby, van den Borne, Gold, & Lindner, 1997). While

similar dimensions have been described by various authors, they used different terms for the concepts. This is discussed in detail in Chapter 3—for now it suffices to note that I will call those two dimensions ego and task competitiveness (Nicholls, 1984; Sage & Kavussanu, 2007; Standage, Duda, & Pensgaard, 2005). The distinction of these two dimensions can be traced to classic work by Mead in 1937. She describes ego competitiveness as "behavior oriented toward another human being, whose worsting [is] the primary goal, and the object or position for which [one] compete[s] [is] secondary" (Mead, 1961, p. 17). In other words, ego competitiveness reflects the desire to win contests and to demonstrate one's superiority over others (Houston et al., 2002). In contrast, Mead describes task competitiveness as "behavior oriented toward a goal in which the other competitors for that goal [are] secondary" (Mead, 1961, p. 17). In task competitiveness, thus, the importance of winning fades into the background and the focus is more on promoting personal development and self-improvement (Ryckman, Hammer, Kaczor, & Gold, 1996). Empirical evidence supports the two-dimensionality of competitiveness (Houston et al., 2002).

For the discussion of unethical behavior in contests the distinction between ego and task competitiveness is particularly interesting because it suggests that winning is not everybody's primary goal in contests. So far, I assumed that contestants' primary goal was to win the contest and consequently, that unethical behavior was a rationally justified way of achieving that goal. However, the two-dimensional conceptualization of competitiveness suggests that there are people, who compete because it provides them with unique opportunities for personal development. When winning contests becomes secondary, unethical behavior aimed at winning is no longer rational. This is because unethical behavior may promote winning contests, but it is inapt for promoting personal development and self-improvement (unless one wants to improve one's cheating skills, of course). In line with this argument, I would expect ego competitiveness to be associated with more unethical behavior, while task competitiveness should be associated with more ethical behavior. This hypothesis is supported by a study in which subjects are presented with various questionable behaviors (Mudrack et al., 2012). The authors show that subjects scoring high on ego competitiveness are more likely to endorse the questionable behavior and claim that they would employ the behavior themselves. As expected, the opposite is true for task competitiveness—this characteristic is associated with more ethical intentions. These results suggest that unethical behavior in contests tends to occur more among ego competitive people. However, in light of this dissertation's overarching research goal—to reduce unethical behavior in contests—the direct practical relevance of this presumption is rather small. This is because thus far,

competitiveness is characterized as a trait, as a feature of one's personality. As laid out earlier, such traits are stable and not readily changed (Hamaker et al., 2007). To stress this characteristic, I will refer to the concept as *trait competitiveness* hereafter (Harris & Houston, 2010). As a personality characteristic, trait competitiveness is relatively stable over time (Hamaker et al., 2007). It is thus unfeasible to alter employees' trait competitiveness in an attempt to reduce unethical behavior in contest.

However, the literature review in Chapter 2 points to a related concept, which has been studied much less, namely *state competitiveness* (Bachman, Brewer, & Petitpas, 1997; Malhotra, 2010). State competitiveness is a momentary variant of competitiveness. It reflects a person's competitiveness in a specific moment. A key difference between trait and state competitiveness is that the former is relatively stable, while the latter may vary from one situation to another. State competitiveness is not independent, though. Instead, it depends on the attributes of the person (including trait competitiveness) as well as the characteristics of the situation (Hamaker et al., 2007). In other words, a trait is an attribute of a person, while a state is an attribute of a "person-in-a-situation" (Steyer, Mayer, Geiser, & Cole, 2015, p. 78). A person's trait competitiveness may be understood as that person's baseline level of competitiveness, while state competitiveness revolves around that level—being sometimes higher and sometimes lower, depending on the situation (Hamaker et al., 2007). Importantly, this understanding demands that state competitiveness is conceptualized congruently with trait competitiveness. Accordingly, "ego" and "task" are adopted from two-dimensional trait competitiveness and applied to state competitiveness, too. Consequently, I differentiate between ego and task state competitiveness.

The literature regularly refers to concepts corresponding to ego state competitiveness, but using different names, such as "comparison concerns" (Garcia, Tor, & Schiff, 2013, p. 235), "desire to win" (Malhotra, 2010, p. 139), "motivation to win" (Kilduff, 2014, p. 944) "competitive motivation" (Garcia & Tor, 2009, p. 871), "competitive arousal" (Ku, Malhotra, & Murnighan, 2005, p. 89; Nichols, 2012, p. 192), and "performance orientation" (Kilduff, Galinsky, Gallo, & Reade, 2016, p. 1513). All these concepts reflect the idea of ego state competitiveness. Concepts corresponding to task state competitiveness are not readily found in the literature. However, Malhotra (2010) hints at a two-dimensional understanding of state competitiveness, while Hartmann and Schreck (2018) are the first to explicitly characterize ego and task state competitiveness, referred to by them as rivalry-focus and task-focus, respectively.

There are two properties that make ego and task state competitiveness so interesting with regard to reducing unethical behavior in contests. First, state competitiveness is subject to manipulation—that is, someone's level of state competitiveness can be regulated to some extent by changing specific elements in the environment. The extent to which state competitiveness is elicited and which of the two dimensions dominates depends on the person's traits as well as situational aspects (Hamaker et al., 2007). Once more: while traits are not easily altered, a contest organizer does have some control over the situational aspects, such as the prize or the number of contestants (Harbring & Irlenbusch, 2011; Vandegrift & Holaday, 2012). Thus, a company could in principle alter the situation in order to affect state competitiveness in a desired way. But what exactly would be a desired way? This brings me to the second property of state competitiveness that makes it interesting for reducing unethical behavior. I argued earlier that ego trait competitiveness would be associated with unethical behavior in contests, while task trait competitiveness would be associated with ethical behavior in contests. The rationale behind this idea is that unethical behavior is conducive to the goal of winning contests (prominent in ego trait competitiveness) but not conducive to the goal of personal development or self-improvement (prominent in task trait competitiveness). The fact of the matter is that this rationale is valid for state competitiveness just as much as for trait competitiveness. Hence, ego state competitiveness is expected to cause unethical behavior, while task state competitiveness is expected to cause more ethical behavior. So far, both hypotheses remain to be tested. If the hypotheses found empirical support, state competitiveness could become a key variable in reducing unethical behavior in contests. Testing the hypotheses demands an instrument for measuring ego and task state competitiveness. I will elucidate the measurement of state competitiveness in the following section.

Economists regularly use a behavioral measure that can be argued to gauge state competitiveness (Bönte et al., 2017). In a typical laboratory study subjects have to work on a real task, such as solving math problems (Niederle & Vesterlund, 2007). Subjects then choose whether they prefer to be remunerated based on a piece-rate (e.g., 50 cents for each solved problem) or based on a relative performance scheme (e.g., $ 2 if they solve more problems than a randomly selected partner; $ 0 if the partner solves more). This choice reflects the preference for competing in that moment. In that sense, it is a dichotomous measure of state competitiveness. The weakness of this method is that it does not differentiate between ego and task state competitiveness.

Some authors who arguably assess ego state competitiveness employ survey questions such as “Item value aside, how important is ‘winning’ (beating other bidders) to you?” (Malhotra, 2010, p. 141) or “When competing against this person, I am more concerned about whether I win than how I win” (Kilduff et al., 2016, p. 1522). These are single items, which have not been validated and cannot be regarded appropriate instruments for measuring ego state competitiveness. To the best of my knowledge, there is no instrument that assesses ego and task state competitiveness in tandem. To close this gap and thereby enable the empirical test of the link between state competitiveness and unethical behavior, I develop a brief self-report instrument to measures ego and task state competitiveness in Chapter 3.

3. Reducing ego state competitiveness to mitigate unethical behavior in contests (Ch. 4)

In the previous section, I hypothesized that state competitiveness could be manipulated by altering attributes of the situation and that ego vs. task state competitiveness would be opposingly associated with ethical behavior in contests. If this were true, state competitiveness could be manipulated in a way that decreases cheating. The empirical test of these hypotheses is conducted in an experiment and reported in Chapter 4.

The first hypothesis asserts that state competitiveness can be manipulated. Of course, there is a specific direction in which state competitiveness should be manipulated. Specifically, the objective would be to reduce ego state competitiveness and increase task state competitiveness—both strategies are expected to lead to less unethical / more ethical behavior.

How exactly can state competitiveness be manipulated? The framework of unethical behavior in contests (Chapter 2) illustrates three determinants of state competitiveness, namely attributes of the person, attributes of the situation, and contest attributes. Attributes of the person include one’s age or gender, but also personality traits or specific characteristics such as trait competitiveness (Digman, 1990). Attributes of the person are relatively stable and usually not readily changed. Therefore, person attributes constitute no sensible starting point for changing state competitiveness. The next category, attributes of the situation, includes broader characteristics of the setting, such as the organizational culture, but also more particular aspects such as an ongoing rivalry with a competitor. Attributes of the situation are not suited for manipulating state competitiveness, either, because they are typically not controlled by the contest organizer. The variables that the contest organizer

controls are summarized under the category attributes of the contest. These are the variables that a contest organizer may manipulate to affect state competitiveness.

Finding an appropriate contest attribute is no straightforward task. The target variable must be readily changed not only in the field but also in the context of a study. Moreover, the variable must either reduce ego state competitiveness or boost task state competitiveness. Lastly, the variable should not decrease effort, as is the case for the variable prize spread. While a smaller prize spread reduces cheating, it also reduces effort (Harbring & Irlenbusch, 2011; Larkin & Pierce, 2015). A variable that may fulfill all those criteria is contest framing (Sage & Kavussanu, 2007; Standage et al., 2005). A contest can be framed to its participants in terms of ego or task competition. This is achieved, for instance, by stressing either the importance of winning and demonstrating one's superiority or the importance of mastering the task, having fun, and taking the opportunity for personal development (Standage et al., 2005).

Decades of research on framing effects have demonstrated that the way a situation is framed can affect behavior (Tversky & Kahneman, 1981). Framing has also been studied in the context of competition. For instance, framing a contest in terms of potential gains is associated with more ethical behavior compared to framing the contest in terms of potential losses (Cameron, Miller, & Monin, 2008; Grolleau, Kocher, & Sutan, 2016; Pettit, Doyle, Lount, & To, 2016; Schindler & Pfattheicher, 2017). However, the other side of the coin is that gain framing is also associated with a decrease of effort (Brooks, Stremitzer, & Tontrup, 2012; Hossain & List, 2012). Decreasing the likelihood of cheating by using gain framing thus comes at the price of decreased effort. Framing a contest in terms of ego vs. task competition, on the other hand, is not known to affect effort. Hence, it constitutes a promising candidate for controlling ego and task state competitiveness. The study I report in Chapter 4 indeed suggests that ego state competitiveness increases when the contest is framed in terms of ego competition. The results thus support the first of the two hypotheses.

Let's come back to the second of the two hypotheses I raised in the beginning of this section. It asserts that ego state competitiveness causes unethical behavior. In the study I report in the fourth chapter, subjects compete in the matrix task, which involves finding pairs of numbers that add up to ten (Mazar, Amir, & Ariely, 2008). Participants have the chance to cheat to increase their chances of winning the contest. The results suggest that subjects in the ego framing condition experience not only more ego state competitiveness, but also cheat more. The second hypothesis is thus supported, too: ego state competitiveness is associated with unethical behavior.

The following three chapters are stand-alone papers to be published in peer-reviewed journals. The literature review (Chapter 2) requires some revisions before it will be re-submitted to a journal. The scale development paper (Chapter 3) and the cheating experiment (Chapter 4) will shortly be submitted to different journals, as well. Chapter 5 comprises a synthesis and general discussion of my research.

CHAPTER 2[3]

Contests and Unethical Behavior in Organizations—A Review and Synthesis of the Empirical Literature

Abstract

Contests are widely used in business contexts because they are believed to increase employees' effort and performance. A downside of such contests is that they may provide incentives for unethical behavior directed at improving one's own relative position. From an organizational design perspective, it is thus important to understand how contests should be designed so that unethical behavior is reduced while maintaining the positive effects on effort. Research from the social and behavioral sciences can offer relevant insights here, as in those fields competition has long been a subject of academic interest. The aim of this review is to offer a systematic account of the growing literature on contests and unethical behavior, thereby shedding light on why and when contests among employees may lead to unethical behavior. To this aim, we also develop an organizing framework that allows for a structured and integrative discussion of the vast, multi-disciplinary literature. Finally, our review identifies several directions for future research.

[3] This paper is coauthored by Simon Piest (SP) and Philipp Schreck (PS). SP developed the framework, reviewed the literature, and wrote the first version of the manuscript. PS revised the manuscript. Both authors discussed the results throughout the project and wrote the final version of the manuscript.

1. Unethical behavior in contests

Many organizations run internal contests in order to induce competition among their employees. They often do this because the various incentives involved in competition are believed to increase motivation, effort, and performance (Dechenaux, Kovenock, & Sheremeta, 2015; Lazear & Rosen, 1981). For example, employees compete for bonuses in sales contests (Brown, Cron, & Slocum, 1998), for promotion (Dechenaux et al., 2015; Lazear & Rosen, 1981), or for symbolic awards (Charness, Masclet, & Villeval, 2014).

If employees are motivated to perform well in a contest, they will behave in ways that are likely to improve their relative position in that contest. The most straightforward way of improving one's relative position is to exert more effort and thereby increase performance (Harbring & Irlenbusch, 2003; Murayama & Elliot, 2012). Indeed, empirical research suggests that organizational contests can lead to higher effort and performance. For example, tournament pay schemes have been shown to have strong effects on performance (Delfgaauw, Dur, Sol, & Verbeke, 2013; Gneezy, Niederle, & Rustichini, 2003b; Harbring & Irlenbusch, 2003). Recent findings from experimental studies suggest that mere rankings can also enhance performance beyond the monetary incentives provided by such pay schemes (Azmat & Iriberri, 2010; Blanes i Vidal & Nossol, 2011; Hannan, Krishnan, & Newman, 2008; Kuhnen & Tymula, 2012; Tafkov, 2013; Tran & Zeckhauser, 2012). These desired effects add to the explanation of the widespread use of contests in organizations, for example in the "gamification" of tasks, which involve performance comparisons within a peer-group (Reeves & Read, 2013; Werbach & Hunter, 2012).

However, while contests seem able to produce favorable motivational and performance effects, these are not the only possible consequences. Besides increasing effort, employees can also use illegitimate ways of increasing their relative position in a contest (Belot & Schröder, 2013). More specifically, they can engage in two generic strategies which we label here *sabotage* and *cheating* (Preston & Szymanski, 2003). Sabotage refers to behaviors directed at decreasing the absolute performance score of a competing colleague. Examples of sabotaging colleagues at work include locking their workstations, transferring false information to them, or destroying their work (Charness et al., 2014). Cheating, in contrast, refers to behaviors directed at manipulating one's own absolute performance score. Examples of cheating to improve one's rank include bribery, strategic misreporting, and other ways of manipulating the evidence for one's performance to one's own advantage (Rigdon &

D'Esterre, 2015). Both strategies, sabotage and cheating, lead to the same result—they improve one's own position in the contest.[4] However, as both contradict commonly accepted norms such as honesty and fairness, they are considered illegitimate and hence unethical.[5]

From an organizational design perspective, it is important to develop measures directed at preventing such unethical behavior in otherwise useful contests. This goal, in turn, requires a thorough understanding of how contests can cause unethical behaviors. Research from the social and behavioral sciences can offer relevant insights, as in those fields competition has long been a subject of academic interest (e.g., Deutsch, 1949; Triplett, 1898). Currently, there is a notable upsurge in experimental research on contests and unethical behavior from the angles of economics (e.g., Conrads, Irlenbusch, Rilke, Schielke, & Walkowitz, 2014; Harbring & Irlenbusch, 2011) and psychology (e.g., Kilduff, Galinsky, Gallo, & Reade, 2016; Pettit, Doyle, Lount, & To, 2016). This research has produced informative and useful findings on the effects of contests on unethical behavior. Although this literature is growing, there is no thorough account of how and why contests can cause unethical behaviors. Existing reviews of the literature usually focus on the effects of contests on performance (e.g., Murayama & Elliot, 2012). For example, the recent review of research on contests by Dechenaux et al. (2015) includes only a brief section on sabotage in contests. So far, no review of the relevant research summarizes comprehensively the variables and effects that play a role in understanding the nexus between contests and unethical behavior in organizations.

The aim of our review is to fill this research gap. Its main contribution is to offer a systematic account of this literature, thereby shedding light on why and when contests among employees lead to unethical behavior. To this aim, we also offer subsidiary contributions to the literature. We develop an organizing framework that is based on a concise and consistent terminology and hence allows for a structured and integrative discussion of the vast, multi-disciplinary literature. Finally, our review allows us to identify some directions for future research.

[4] The literature on unethical behavior in contests sometimes lists a third category—*collusion* (Harbring & Irlenbusch, 2003; Preston & Szymanski, 2003). Collusion works by agreeing on an outcome whereby the involved parties disable the competition. The defining criterion of negative goal interdependence is thus no longer fulfilled (Deutsch, 1949). Collusion is therefore not part of our review.

[5] Unethical behavior is commonly defined as an act that is harmful to others and runs counter to ethical norms widely accepted in a community (Jones, 1991).

The rest of this paper is organized in three parts. In the next section, we develop a simple but precise conceptual framework for the analysis of contests and unethical behavior (Section 2). This framework will enable us to pursue our main goal; namely, to review and classify systematically the empirical literature on contests and unethical behavior in organizations (Section 3). Finally, on the basis of our review, we will identify open research questions and avenues for further research on contests and unethical behavior (Section 4).

2. An organizing framework for analyzing unethical behavior in contests

Our literature review will discuss empirical studies that help explain why and under which conditions contests can lead to unethical behavior. The studies vary in the focus they have when explaining unethical behavior as a consequence of contests. For example, some studies focus on situational forces that may cause unethical behavior, while others focus on personality characteristics that make people more inclined to behave unethically. To account for the variety of explanations proposed in the studies, we introduce a simple framework that allows us to organize the literature in a systematic way, and hence eases the discussion.

The framework's basic structure essentially reflects a person–situation interactionist view of behavior (Lewin, 1935; Treviño, 1986). More specifically, it accommodates empirically tested variables that affect affective state or unethical behavior variables in the context of competition. The framework condenses these variables into a few distinct components, thereby enabling a quick overview of the aspects that play a role in the effect of contests on unethical behavior. The framework is not based on one single theory. Rather, it is the result of an effort to organize the screened literature, that is, a bottom up approach (for comparable uses of research frameworks, see Joos, 2019; Thomas, 2018).

The framework also addresses the lacking terminological clarity in the literature on competition. So far, there is no consensus on precisely how competition and related concepts are conceptualized: the same terms are often used to refer to different concepts, while different terms are used to refer to similar concepts. This may be attributed partly to the fact that the topic is approached from diverse backgrounds. But since we want to integrate those findings, we have to translate them into one common language. Hence, we will clarify the key concepts of our review in the course of developing the organizing framework, before we proceed with reviewing the literature on unethical behavior in contests.

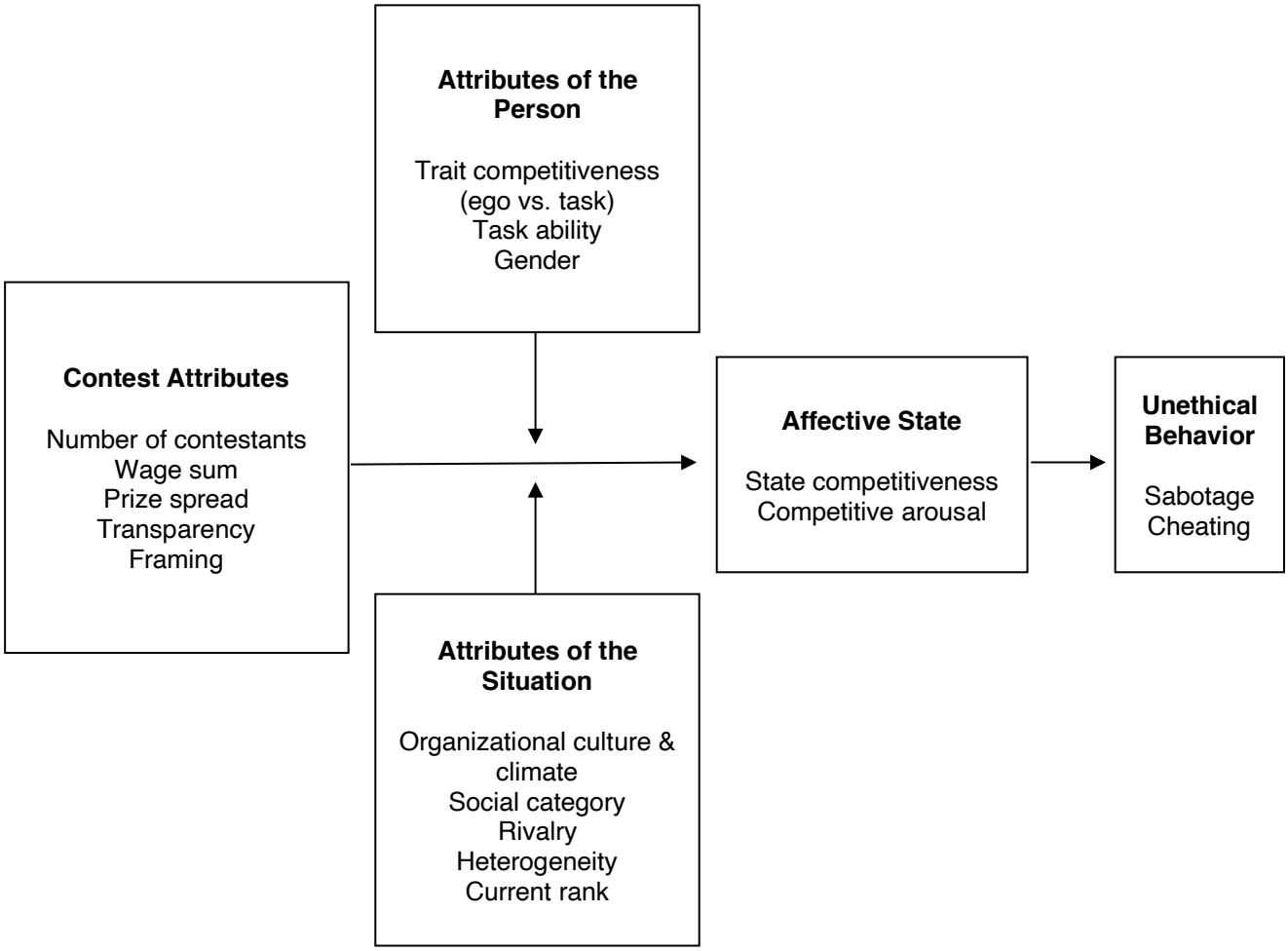

Figure 1. The framework organizes the review and depicts how contests may cause unethical behavior. Various contest attributes trigger affective states that are key drivers of unethical behavior. Attributes of the person and the situation may be conceived as moderators in the effect of contest attributes on the affective states.

2.1. Contest attributes

The purpose of this review is to contribute to a better understanding of how competition between employees in an organization may result in unethical behavior. Organizations usually establish this type of competition in the form of institutionalized *contests*—that is, evaluation and incentive systems that assess an employee's performance relative to coworkers' performance. This is what our framework's first component refers to, but the terms "competition" and "contest" require some clarification.

To begin with, the term "competition" has been used in various different ways in the literature. As Stanne, Johnson, and Johnson (1999, p. 134) summarize in their early meta-analysis on the effects of competition on motor skills performance, "competition has been defined as a situational variable, a cognitive variable, a trait, a motive, or an attitude" (p. 134). Despite the many studies conducted since then, consensus on the definition of competition has yet to be reached. The term "competition" has been used to refer to organizational contests ("a competition"; e.g., Hanek, Garcia, & Tor, 2016, p. 1124; Schurr & Ritov, 2016, p. 1754), to the more general structure of interaction that is typical of contests (e.g., Schreck, 2015), or to the number of competitors (a large number of competitors meaning "high competition"; e.g., Cartwright & Menezes, 2014, p. 57). In this review we follow the classic and simple definition by Deutsch (1949, p. 132) who described competition as a structure of interaction that is characterized by negative goal interdependence. In such a situation two or more actors share a goal in which achievement of the goal by one actor automatically implies that the other actor does not achieve the goal.

In order to avoid ambiguity as much as possible, we restrict our use of the term "competition" to refer only to the general structure of negative goal interdependence (Deutsch, 1949). If we speak of a planned, institutionalized occasion of competition, we use the term "contest." Thus, contests are events, concrete manifestations of competition. As such, a contest occurs between two or more parties (i.e., *contestants*) who pursue the same goal which cannot be attained by all contestants. Examples of contests in organizations include sales contests, employee rankings, or promotion tournaments (Grote, 2005; Lazear & Rosen, 1981; Poujol, Harfouche, & Pezet, 2016; Vriend, Jordan, & Janssen, 2016).

Contests can be characterized in terms of various attributes, such as the number of contestants or the size and spread of prizes (see Figure 1). These contest attributes make up a contest's design and are usually deliberately defined by executive managers. As we will see, whether and how contests may cause unethical behavior depends on the exact design of a contest, that is, on the contest attributes.

2.2. The behavioral outcome—Unethical behavior in the form of sabotage and cheating

Why would a contest cause unethical behavior? To illustrate, let us consider a company that organizes a contest by implementing a performance ranking. The ranking evaluates employees in terms of their performance relative to that of their peers. Most employees attach importance to their rank in such a contest, be it because of the monetary incentives tied to a

specific rank or because of the status associated with it (Tran & Zeckhauser, 2012). Overall, employees can be expected to engage in behaviors that will improve their rank. Although the purpose of such contests is usually to stimulate employee performance, their unintended consequence can be that employees use illegitimate strategies to get ahead in a contest. The respective behaviors to illegitimately improve one's rank fall within one of two categories—sabotage or cheating.

Sabotage refers to costly activities that employees may carry out in order to reduce the performance of competitors; for instance by spreading negative rumors about them (Chen, 2003; Lazear, 1989). Sabotage among employees is always undesired because it reduces overall output (Chen, 2003; Chowdhury & Gürtler, 2015). This reduction in output may be so large that, in the end, output is smaller than it would have been without a tournament incentive system (Carpenter, Matthews, & Schirm, 2010).

While the aim of sabotage is to obstruct in some way the work others perform, the aim of cheating is to manipulate one's own performance measure so as to improve one's rank (Charness et al., 2014; Chen, 2003). For example, a manager who increases his or her apparent output by fraudulent accounting cheats for personal benefit (Berentsen & Lengwiler, 2004).

Experiments comparing sabotage in situations with or without competition suggest that competition increases the occurrence of sabotage (Harbring & Irlenbusch, 2011). This is the case even when winning is not associated with any material gain, which suggests that the causes of behavioral responses to competition are not confined to monetary incentives. Employees seem to attach value to the social status associated with their rank even in the absence of immediate tangible benefits, and this value is sufficiently high for employees to accept the costs of unethical behavior (Charness et al., 2014; Hartmann & Schreck, 2018; Schreck, 2015).

2.3. Attributes of the person

Of course, employees' responses to contests vary. The behavioral effects of a contest depend on various contingencies, including personality characteristics. Our framework's second component thus captures attributes of the person participating in a contest.

Whether employees will behave unethically in a contest depends on various characteristics such as their general preference for or aversion to competition, their gender, and their familiarity with the task. One particularly prominent personal attribute is an

employee's attitude towards competition, a construct we label *trait competitiveness*. Trait competitiveness refers to relatively stable personality characteristics and essentially captures the extent to which someone likes competing. In the past, the term "competitiveness" has been used inconsistently. Some researchers use it to refer to a personality trait reflecting a person's general desire to win (Houston, Harris, Howansky, & Houston, 2015; Newby & Klein, 2014; Smither & Houston, 1992). Others use the term to refer to a "competitive situation" (Harbring & Irlenbusch, 2003, p. 447) or "competitive environments" (Cartwright & Menezes, 2014, p. 56) that are encountered in a "competitive institution," such as a specific university (Gneezy, Niederle, & Rustichini, 2003a, p. 1053). Yet others use the term "competitiveness" to indicate the extent to which two competitors go head to head, based on past performance (Kilduff, Elfenbein, & Staw, 2010). Of all those uses, the most common one is understanding competitiveness as a characteristic of a person, and we follow this understanding in our review. Trait competitiveness has been mostly conceptualized as either one-dimensional or two-dimensional.[6] We will discuss these concepts in more detail when reviewing the corresponding empirical evidence in section 3.3.1.

2.4. Attributes of the situation

As we argued above, the behavioral effects of a contest can vary from one person to another. Importantly, the effects can also vary from one situation to another (even for one individual). Our framework's third component thus comprises attributes of the situation that may affect whether and to what extent competition among organizational members causes them to act unethically. For example, the degree to which employees respond to competition in unintended ways depends on characteristics such as organizational climate, the presence and design of monitoring systems, and the arguments that legitimize the use of competitive incentive systems in the organization. Another important situational factor is the personal relationship between the contestants; in particular, whether they have a history of head-to-head situations (Kilduff et al., 2010).[7]

[6] Occasionally, trait competitiveness has also been conceptualized as multi-dimensional (Franken & Brown, 1995; Newby & Klein, 2014).

[7] The term "rivalry" has been used to describe a specific relationship between two competitors (Kilduff et al., 2010) or a form of fierce competition in which a competitor is focused on beating the opponent at any cost (Hartmann & Schreck, 2018; Mead, 1961). In other contexts, the terms "rivalry" and "competition" are used interchangeably (e.g., Brandts, Riedl, & Van Winden, 2009), while Malhotra (2010) operationalized rivalry as the number of participants in a contest, where more contestants are associated with less rivalry. In this review,

While the role of context variables in the effect of contests on performance has been widely studied (Brown et al., 1998; Franken & Brown, 1995; Garcia, Tor, & Schiff, 2013; Gneezy et al., 2003a; Murayama & Elliot, 2012), only a few studies have investigated the role of context variables in the effect of contests on unethical behavior. Nevertheless, a person–situation interactionist account of unethical behavior in contests warrants the inclusion of situational attributes as our third component (Lewin, 1935; Treviño, 1986).

2.5. Affective states: state competitiveness and competitive arousal

So far, we have considered the direct link between competition and unethical behavior and how this link may depend on attributes of the person and the situation. In this section we will take into account the motivational mechanisms that explain how exactly contests can cause unethical behaviors (e.g., Hartmann & Schreck, 2018; Kilduff et al., 2016). More specifically, our framework's fourth component comprises variables that describe an employee's affective responses to competition which we refer to as an *affective state*. Based on the literature we review below we argue that competition and contest attributes do not affect behavior directly, but that the effect is a result of the affective responses that competition triggers.

In general, researchers often refer to affective responses to explain how certain stimuli can have behavioral consequences (Elfenbein, 2007; Oreg, Bartunek, Lee, & Do, 2016). Affective states are psychophysiological constructs that can include different dimensions (Harmon-Jones, Gable, & Price, 2013). Moreover, affective states are transient and depend on the situation as well as on the personal characteristics of the actors involved (Hamaker, Nesselroade, & Molenaar, 2007; Steyer, Mayer, Geiser, & Cole, 2015). The literature provides various concepts that describe an actor's state during competition, including "comparison concerns" (Garcia et al., 2013, p. 235), "desire to win" (Malhotra, 2010, p. 139), "motivation to win" (Kilduff, 2014, p. 944; Kilduff et al., 2010), "competitive motivation" (Garcia & Tor, 2009, p. 871), "competitive arousal" (Ku, Malhotra, & Murnighan, 2005, p. 89; Nichols, 2012, p. 192), and "performance orientation" (Kilduff et al., 2016, p. 1513).

In our framework, these concepts are represented by the component "affective states". Within this component we distinguish between two elements in particular: *competitive arousal*, which is a response marked by physiological changes; and *state competitiveness*, a

we follow the work of Kilduff and colleagues and understand rivalry as the special relation between two competitors with a history of head-to-head situations.

motivational state which corresponds to the desire or motivation to win. These variables may be considered as psychological explanations of the effect of competition on unethical behavior. A contestant's affective state at any given moment reflects state competitiveness as well as competitive arousal.

Table 1. Key concepts and their definitions as used in the current review.

Key Concept	Definition and Characterization	Source
Competition	A structure of interaction characterized by negative goal interdependence. Two or more actors share a goal while achievement of the goal by one actor implies that the other actor does not achieve the goal.	Deutsch 1949
Contest	A planned, institutionalized occasion of competition. Examples for contests in organizations include sales contests, employee rankings, or promotion tournaments.	Kohn 1992
Trait competitiveness	A relatively stable personality characteristic that essentially captures the extent to which someone likes competing.	Fletcher & Nusbaum 2008
State competitiveness	A transient motivational state; it captures a person's competitiveness in a given moment.	Bachman et al. 1997
Competitive arousal	A contest-specific form of a physiological state of alertness, involving the activation of various neural systems.	Adam et al. 2005; Veldhuizen van Zanten et al. 2002
Rivalry	A special relation between two similar competitors with a history of head to head situations.	Kilduff et al. 2010
Unethical behavior	Illegitimate behavior with the aim of improving one's relative position (rank) in a contest—either by manipulating one's own performance score (cheating) or by manipulating contestants' performance scores (sabotage).	Charness et al. 2014; Jones 1991; Preston & Szymanski 2003

To summarize, the proposed framework reflects the literature on unethical behavior in contests in terms of five major elements: The characteristics of the contest, the attributes of the person and the environment, the person's current affective state, and the resulting unethical behavior. In the next section, we will use our framework to review the empirical

literature on contests and unethical behavior. To realize this aim, a consistent terminology is important so that the research can be integrated into a complete picture of contests and unethical behavior. Table 1 summarizes the definitions of the key concepts as used in this review.

3. Reviewing the empirical literature on unethical behavior in contests

3.1. Literature search strategy and inclusion criteria

Before starting the literature search, we defined the following criteria that would qualify studies for inclusion in our review. Specifically, we were looking for empirical studies focusing on individuals in contests and the variables that may regulate contestants' sabotage or cheating behavior in such situations. To obtain a starting sample of relevant literature, we used the EBSCO*host* platform to conduct a systematic keyword search in the databases *EconLit* and *Business Source Complete*. To account for the competition-setting, studies had to include any of the following terms in the title: compete; compete*; contest*; tournament*; rank*. Moreover, to account for the unethical-behavior-outcome, studies had to include any of the following terms in the title: unethical; ethic*; immoral*; moral*; sabotag*; cheat*. Lastly, to exclude articles with studies strictly on competition between organizations (i.e., market competition), the search results were required to contain at least one of the following terms anywhere in the text: individual*; person*; colleague*; worker*; employee*. The language was restricted to English. To avoid publication bias, we did not demand the results to be published in peer reviewed journals—we considered results from (academic) journals and working papers. This search yielded 171 results (December 2019).

By scanning the extracted abstracts, we identified 17 articles that satisfied our inclusion criteria, i.e., being an empirical study on determinants of unethical behavior in interindividual competition. Starting from this set of articles, we identified another 19 articles that qualified for inclusion by forward and backward tracing. Some of these articles were not found during our initial literature search because the respective journals were not related to economics (e.g., Veldhuizen van Zanten et al., 2002, published in Psychophysiology). Others were not found initially because the articles' titles included terms referring to specific unethical behaviors that were not among our search terms, such as *lying/honesty* (Schreck, 2015) or *salesperson deviance* (Jelinek & Ahearne, 2010). In total, thus, the following review is based on 36 empirical studies.

3.2. Contest attributes

Lazear (1989) warns that organizations should not introduce contests in the form of tournaments without considering the specific circumstances. For example, cooperation among employees may be too important for the organization to jeopardize it by introducing competition. While it is certainly important to consider the circumstances in which a contest takes place, it is equally important to examine how exactly the contest is designed. There are multiple attributes that characterize a contest, such as the number of contestants, the distribution of prizes (i.e., the prize spread), and the provision of intermediate feedback on ranking. Many of these attributes have been researched with regard to their effect on employee performance, and some have also been researched with regard to their effect on unethical behavior. These attributes will be discussed in greater detail in the following sections.[8]

3.2.1. Number of contestants

A smaller number of contestants is associated with higher performance—a phenomenon that has been nicknamed the "n-effect" (Dechenaux et al., 2015; Garcia & Tor, 2009; Vandegrift & Holaday, 2012). Theoretical work suggests that small numbers of contestants may also be related to higher degrees of sabotage (Gilpatric, 2011). The explanation for this effect is that sabotage simultaneously produces negative externalities for the victim and positive externalities for all other contestants (Chowdhury & Gürtler, 2015; Konrad, 2000). In other words, all contestants (except for the victim) gain the same advantage as the saboteur. Moreover, as group size increases, the number of competitors that the saboteur needs to undermine in order to improve significantly his or her chances of winning also increases and, as sabotage is costly, it becomes less attractive. However, despite these clear theoretical predictions, the link between group size and sabotage has not yet been tested (Chowdhury & Gürtler, 2015).

Looking at cheating, the situation looks somewhat different. Cheating creates a negative externality for *all* other contestants because it reduces the other contestants'

[8] We acknowledge the existence of more general determinants of unethical behavior, such as the possibility of getting punished when caught cheating or the mere likelihood of getting caught (Gilpatric, 2011). However, an extensive discussion of such paths is beyond the scope of the paper because they are general strategies to decrease unethical behavior and not specific to contests. For an overview of punishment in organizations, the reader may refer to Treviño (1992) or Balliet, Mulder, and Van Lange (2011).

probability of winning (Konrad, 2000). This suggests that cheating should not be related to group size or, if anything, that the relation between cheating and group size should be positive, because in larger groups the negative externality affects more competitors (Konrad, 2000). Harbring and Irlenbusch (2008) tested this prediction. They conducted an experiment with groups of one principal plus two, four, or eight agents who chose how much costly effort to expend and what level of "sabotage" to engage in. However, an agent's decision to sabotage entailed negative externalities for all other contestants, so the saboteur was the only one who benefited from his or her behavior. Arguably, therefore, this setup resembles more a case of cheating than of sabotage (Chowdhury & Gürtler, 2015). And in line with the prediction that cheating should not be related to group size, Harbring and Irlenbusch (2008) find no effect of the number of contestants.

3.2.2. Wage sum

Performance in contests increases with the wage sum, i.e., the overall value of prizes (Harbring & Irlenbusch, 2011). Does sabotage in tournaments depend on the wage sum, too? Empirical evidence suggests that the wage sum is not a predictor of unethical behavior in contests. Harbring and Irlenbusch (2011) conducted a study with groups of three agents and one principal. The principal could decide between running a contest with a high and a low wage sum. The prize spread remained constant in both conditions (e.g., the winner's prize was always 48 units higher than the loser's prize). The data suggest that there was no difference between the levels of sabotage that the agents chose when the wage sums were high and when they were low.

3.2.3. Prize spread

One of the most extensively researched contest attribute is prize spread, i.e., the distribution of prizes that can be won in a contest (Falk, Fehr, & Huffman, 2008; Lazear & Rosen, 1981). In a simple contest between two individuals with a total prize (i.e., wage sum) of $100, the largest possible prize spread would be awarding $100 to the winner and $0 to the loser, whereas a very small prize spread would be awarding $51 to the winner and $49 to the loser. It has been demonstrated that larger prize spreads lead to higher effort in contests (Garicano & Palacios-Huerta, 2005; Harbring & Lunser, 2008; Lazear & Rosen, 1981), but at the same time they may lead to more unethical behavior. Various laboratory experiments have shown that agents choose higher levels of sabotage when prize spreads increase (Falk et al., 2008; Harbring & Irlenbusch, 2005, 2011; Vandegrift & Yavas, 2010).

Further evidence for the effect of prize spread on sabotage comes from a field study on soccer matches (Garicano & Palacios-Huerta, 2005). Before 1994, soccer teams received two points for winning a match, one point for a tie, and no points for losing. In 1994, the rules were changed in some parts of the world, so that winning teams received three points, while a tie and losing still yielded one and zero points respectively. The prize spread was thus increased. As the new rules applied only in specific parts of the world, some teams played according to both rules in the same season, depending on where the match took place. The results of this natural experiment confirm that the increased prize spread led the players to exert more effort, but also more sabotage in the form of so-called "dirty play" (Garicano & Palacios-Huerta, 2005).

Experimental evidence suggests a link of prize spread and cheating, too. For example, subjects overstate their performance in contests with larger prize spreads (Conrads et al., 2014; Feltovich, 2019). However, Cartwright and Menezes (2014) contradict the positive relation between prize spread and cheating. They manipulated prize spread in a lab experiment by awarding bonus payments either to the best six (small prize spread) or two (large prize spread) out of 15 contestants. Their results suggest that subjects cheated more when the prize spread was lower. A possible explanation for these results is that the psychological costs of cheating did not outweigh the relatively low chance of winning the bonus in the low prize spread condition (Cartwright & Menezes, 2014).

3.2.4. Transparency

Someone who considers sabotaging a competitor to gain an advantage needs to be aware of his or her own rank and the rank of the competitors. If this information is withheld from the contestants (e.g., Konrad, 2000), they will not know who to sabotage. Sabotaging someone who ranks low, or at least below a contestant's own rank, is a waste of resources. In contrast, the top ranking competitors are the most dangerous and therefore the likeliest victims of sabotage (Gilpatric, 2011; Gürtler, Münster, & Nieken, 2013).

Gürtler et al. (2013) designed an experiment to test the hypothesis that less transparency on ranks will result in lower levels of sabotage (Gilpatric, 2011; Gürtler et al., 2013). In their experiment, groups of three subjects performed a chosen effort task. The authors determined whether the contestants would be able to observe each other's effort (rank) or not before the contestants decided whether they wanted to sabotage one of the others. The results of this experiment confirmed that effort is associated with being sabotaged. The subjects whose high degree of effort could be observed were punished by the

other contestants. But when the contestants had no information about their competitors' effort, they did not know whom to sabotage, so effort was no longer related to being sabotaged. As a consequence, participants were more willing to expend high effort when information about the other competitors' performance was concealed. The authors do not clarify, however, whether a lack of transparency about competitors' effort level generally reduced sabotage or whether sabotage was just more equally distributed.

3.2.5. Framing

Another contest attribute that has been empirically tested is how a contest is framed. Framing refers to different ways of designing the structure of choices available to the contestants, which influences how exactly the contestants perceive competition. For example, making sabotage explicit and calling the practice by its name appears to reduce that kind of unethical behavior. Harbring and Irlenbusch (2011) conducted a lab experiment in which participants had the option to sabotage each other. In one condition, this option was explicitly called "sabotage," while in another condition the term "sabotage" was avoided (the options had neutral labels). The results of this experiment indicate that explicit references to sabotage make its occurrence less likely. At the same time, there was no effect of framing on effort.

Pettit et al. (2016) provide another example of how framing affects behavior. In their experiments on competition and cheating, the authors framed otherwise identical contests in two different ways. In one setting the contest was framed as a chance to gain in status when getting ahead; in the other setting the contest was framed as a risk of losing in status when falling behind. In all variations of this experimental design, the participants were more inclined to cheat in order to avoid losing status rather than to gain in status. While the effect of gain versus loss framing on unethical behavior (mostly cheating) has been widely replicated (Grolleau, Kocher, & Sutan, 2016; Kern & Chugh, 2009; Schindler & Pfattheicher, 2017), Pettit et al.'s (2016) study remains the only one that focused on contests.

3.3. Attributes of the person

3.3.1. Trait competitiveness

Trait competitiveness refers to relatively stable personality characteristics and essentially captures the extent to which someone likes competing. Trait competitiveness has been mostly conceptualized as either one-dimensional or two-dimensional.

One-dimensional trait competitiveness can be described as a "pure taste for having the best rank in the performance distribution" (Charness et al., 2014, p. 39) or an individual's propensity to join and enjoy a contest (Fletcher & Nusbaum, 2008; Martens, 1975). In contrast to state competitiveness, which reflects preferences in a given moment, trait competitiveness describes a consistent and enduring preference for winning contests. Most definitions of one-dimensional trait competitiveness describe it as the desire to win and be better than others in interpersonal situations (e.g., Harris & Houston, 2010; Helmreich & Spence, 1978; Houston, McIntire, Kinnie, & Terry, 2002; Smither & Houston, 1992; Spence & Helmreich, 1983). Similar concepts include "dispositional competitiveness" (e.g., Bachman, Brewer, & Petitpas, 1997, p. 204; Veldhuizen van Zanten et al., 2002, p. 760), "competitive orientation" (Smither & Houston, 1992, p. 408), and "intentional competitiveness" (Kohn, 1992).

Research has shown that trait competitiveness is associated with unethical behavior (Jelinek & Ahearne, 2010; Terpstra, Rozell, & Robinson, 1993). Jelinek and Ahearne (2010) found a positive relationship between one-dimensional competitiveness and sabotage, e.g., in the form of criticizing colleagues at the workplace. Terpstra et al. (1993) assessed one-dimensional trait competitiveness in a study of insider trading (Helmreich & Spence, 1978). Subjects who scored higher on trait competitiveness also chose the unethical options more often. The authors concluded that "highly competitive individuals have an intense desire to compete and win [and this] may override the perceived importance of the ethicality" (Terpstra et al., 1993, p. 384).

Two-dimensional trait competitiveness accounts for the differences in the goals that competitors have. Some individuals compete mainly for the sake of winning and being the best: beating the colleagues is their primary interest, while task mastery is of secondary significance (Horney, 1936; Ryckman, Hammer, Kaczor, & Gold, 1990; Ryckman, Thornton, & Butler, 1994). We call this dimension *ego trait competitiveness*. But there are also employees primarily interested in self-improvement, mastery, and enjoyment of the task at hand. For such people, beating competing colleagues is of secondary importance and ranking serves mainly as a way of assessing to what extent they are successful in mastering the task at hand (Mudrack, Bloodgood, & Turnley, 2012; Ryckman, Hammer, Kaczor, & Gold, 1996). We call this dimension *task trait competitiveness*. Two-dimensional trait competitiveness thus comprises ego trait competitiveness and task trait competitiveness (Nicholls, 1984).

This distinction is based on earlier two-dimensional conceptualizations of trait competitiveness. For example, Ryckman, Libby, van den Borne, Gold, and Lindner (1997, p.

271) distinguish between "hypercompetitiveness" and "personal development competitiveness," Griffin-Pierson (1990, pp. 108-109) differentiate between "interpersonal competitiveness" and "goal competitiveness," Franken and Brown (1995, p. 175) between "ego-orientation" and "task-orientation," and Tassi and Schneider (1997, p. 1557) between "other-referenced competition" and "task-oriented competition." Such two-dimensional conceptualization of competition are further supported by a factor analysis of ten competitiveness scales resulting in two factors that the authors called "Self-Aggrandizement" and "Interpersonal Success" (Houston et al., 2002, p. 293).

Of all the labels for the two dimensions we find the simplest yet meaningful one to be ego vs. task competitiveness (Franken & Brown, 1995; Nicholls, 1984). The literature provides no clear indication of the two dimensions' relation—while some research points to a positive correlation of ego and task trait competitiveness (Tassi & Schneider, 1997), other work suggests no correlation of the two dimensions (Ryckman et al., 1997), or even a negative correlation (Franken & Brown, 1995).

Differentiating between two dimensions of trait competitiveness allows for more refined predictions of whether actors will behave unethically in contests. For example, ego-competitive employees may achieve their primary goal—to beat their opponents—better by unethical means such as cheating or sabotage. In contrast, the primary goal of task-competitive people would be to master the task in the best possible way (Ryckman et al., 1996). In the latter case, neither cheating nor sabotage contributes to achieving this goal. Consequently, one would expect the effect of competition on unethical behavior to be particularly strong in highly ego-competitive people. In contrast, the effect of competition on unethical behavior should disappear or become negative in people who are highly task-competitive, because unethical behavior does not promote attaining the goals of task mastery and personal development (Mudrack et al., 2012).

Mudrack et al. (2012) studied empirically the relation between two-dimensional trait competitiveness and unethical behavior. In their experiment, the subjects were asked to read three vignettes in which the actor made a direct gain at the expense of others and then to judge whether the actor's behavior was ethical or not and to estimate how likely they were to engage in such behavior themselves. Mudrack et al. (2012) found that ego trait competitiveness is negatively related while task trait competitiveness is positively related to ethical judgments and behavioral intentions. Beu, Buckley, and Harvey (2003) assessed ethical intent through two different scenarios: bribery in a business context and cheating in an academic context. In contrast to Mudrack et al. (2012), Beu et al. (2003) suggested that task

trait competitiveness is not related to ethical intent. Unfortunately, the authors did not assess ego trait competitiveness. More research is needed to determine how task and ego trait competitiveness influence the effect of competition on unethical behavior.

3.3.2. Task ability

It goes without saying that task ability is related to task performance. But ability may also be related to cheating. Empirical research suggests that participants in experiments who are not able to successfully complete the task will cheat, possibly in an attempt to save face (Schwieren & Weichselbaumer, 2010). This intuitive finding has been corroborated in field studies. For example, soccer teams with lower ability compared to the competing team commit more fouls and thus engage in more sabotage (e.g., Deutscher, Frick, Gürtler, & Prinz, 2013). Similarly, less qualified judokas tend to sabotage more qualified opponents (Balafoutas, Lindner, & Sutter, 2012). In contrast to these findings, however, Vandegrift and Yavas (2010) could not confirm that in an experiment involving a real-effort task subjects of lower ability engaged more in sabotaging their opponents. In sum, the overall evidence is mixed in this case. Other research suggests that subjects take their competitors' ability into account when deciding about sabotaging or cheating (Deutscher et al., 2013; Deutscher & Schneemann, 2017; Frick, Gürtler, & Prinz, 2008; Harbring, Irlenbusch, Kräkel, & Selten, 2007). We will discuss this research in Section 3.4 (attributes of the situation) under the heading "Heterogeneity."

3.3.3. Gender

There is considerable evidence that men and women react differently to competition. Gender differences have been investigated mainly in the context of performance outcomes (Gneezy et al., 2003a; Gneezy & Rustichini, 2004; Saccardo, Pietrasz, & Gneezy, 2018; for a review, see Niederle & Vesterlund, 2011). A few studies, however, focused specifically on gender differences in the relationship between competition and unethical behavior. These studies suggest that men are more inclined to engage in sabotage or to have unethical intentions in response to competition than women (Dato & Nieken, 2014; Hartmann & Schreck, 2018; Nieken & Dato, 2016; Schreck, 2015; Terpstra et al., 1993).

At closer inspection, it appears that these gender differences may be ascribed to differences in task ability, personality, or the expectation of being sabotaged by one's opponent. Schwieren and Weichselbaumer (2010, p. 245), for example, found that women cheated slightly more than men, but the authors attributed these differences entirely to

varying levels of task ability. Another variable that may explain gender differences in contests is trait competitiveness: men like competition more than women, as indicated by gender differences on various trait-competitiveness scales (Gill, 1986; Helmreich & Spence, 1978; Hibbard & Buhrmester, 2010; Houston, Farese, & La Du, 1992; Smither & Houston, 1992). Finally, Dato and Nieken (2014, 2019) suggested that the gender differences they found in their study stem from different expectations about the likelihood of being sabotaged by opponents: compared to women, men were more likely to expect their opponents to sabotage them and this may have caused them to engage more in preemptive counter-sabotage than female participants did.

To summarize, there is evidence that both genders cheat when they know that they are not good at a particular task and that their chance of winning without cheating is very low (Deutscher et al., 2013). Yet, some studies find gender differences in unethical behavior in contests. These differences are probably mediated by other variables which vary across genders, such as trait competitiveness, the ability to perform the experimental task, or the expectation of being sabotaged by the opponent.

3.4. Attributes of the Situation

3.4.1. Organizational culture and climate

Brown et al. (1998) demonstrated that employees with different perceptions of a company's competitive climate react differently to the same kind of contest. Similarly, Murayama and Elliot (2012) found that perceived environmental competitiveness affects behavioral outcomes during contests. These findings point to the role that the organizational culture plays in the relationship between competition and behavior. The organizational culture is understood as the set of values and implicit rules that employees refer to, particularly in ambiguous situations (Arnaud & Schminke, 2012; Loe, Ferrell, & Mansfield, 2000; Treviño, 1986). For example, if the organizational culture stresses the importance of winning employees may feel increased pressure to win at any cost and consequently employ unethical behaviors. Experimental evidence suggests that conformity to group norms explains dishonesty in contests—when the group norm is believed to approve dishonesty (Aydogan, Jobst, D'Ardenne, Müller, & Kocher, 2017).

While it is difficult to reproduce organizational culture in the lab, there are survey-based studies looking at employees' perceptions of the prevalent climate in the organization. Hochstein, Zahn, and Bolander (2017) collected surveys from salespeople and their

customers at a car dealership. Their results suggest that salespeople who perceive the climate at the dealership as competitive behave more unethically by giving unbalanced advice to customers to increase chances of closing a deal. Poujol et al. (2016) obtained similar results from a study in the banking sector. These results suggest that it is the perception of an unethical climate in the contest that makes employees more susceptible to unethical behavior. Managers may try to counteract such behavior by stressing a customer orientation and promoting an ethical climate. But Hochstein et al. (2017) suggest that while salespeople's ethical *intentions* may increase, the potentially opposing goals of an ethical climate and a competitive climate deplete salespeople's cognitive resources and thereby ultimately increase unethical behavior.

3.4.2. Social category

According to social categorization theory, every person belongs to multiple social groups or categories. For example, a man may belong to the categories "men," "Germans," "sportsmen," and "fathers" (Hogg & Terry, 2000; Tajfel & Turner, 1979). A social category may be made salient by explicitly stressing it in a contest. Garcia et al. (2013) argue that competitive behavior (i.e., effort) depends on the salience of these categories. This argument makes sense in the case of unethical behavior too: for certain salient social categories, the effect of contest attribute on state competitiveness and arousal may be particularly strong. For example, making the social category "male" salient in a contest (e.g., by reminding male contestants of their sex) may lead to higher levels of state competitiveness, because men are expected to be more competitive than women (Rosenkrantz, Vogel, Bee, Broverman, & Broverman, 1968). Moreover, emphasizing the differences between the distinct social groups of contestants may cause efforts to positively differentiate from the other group (i.e., outgroup). These processes, which are described as outgroup discrimination processes, lead the contestants to focus on achieving superiority, that is, winning (Tajfel, Billig, Bundy, & Flament, 1971), and ultimately may stimulate unethical behavior. Charness et al. (2014) found mixed evidence for this idea: contestants of the same school sabotage each other less than contestants belonging to different schools. On the other hand, contestants belonging to the same school cheated more than contestants belonging to different schools. This example illustrates that some of the variables we review here can have very different effects, depending on the context: for example, on the one hand, similarity (belonging to the same school) can be a source of rivalry and increase unethical behavior (cheating; Charness et al., 2014; Kilduff et al., 2016), but, on the other hand, it can be a source of in-group favoritism

and reduce unethical behavior (sabotage; Charness et al., 2014). In contrast, Benistant and Villeval (2019) divided participants into two groups based on whether they preferred Klee or Kandindsky paintings. In this minimal group setting, there was no effect of group membership on misreporting in a subsequent contest task. That is, subjects cheated irrespective of their competitor's group membership.

3.4.3. Rivalry

Rivalry has been conceptualized as the special relationship between two similar competitors with a history of encounters in contests and with close outcomes (Kilduff et al., 2010; Kilduff et al., 2016). While rivalry can increase motivation and performance (Converse & Reinhard, 2016; Kilduff, 2014), it can also lead to an extreme "win at all costs" attitude, which is associated with economically irrational behavior as well as with unethical behavior (Kilduff et al., 2016). In other words, when an actor encounters a rival in a contest, there is an increased chance that the actor will employ unethical behavior to win the contest.

Empirical support for the role of rivalry in unethical behavior comes from various studies. For example, (Kilduff et al., 2016) found that there is more sabotage (foul play) in soccer matches between rival clubs. The same authors found that the students of Ohio State University who took part in a lab study deceived more when they interacted with counterparts from the University of Michigan, which is considered a rival institution of Ohio State University, than when they interacted with students from their own university (Kilduff et al., 2016). To, Kilduff, Ordoñez, and Schweitzer (2018) demonstrated that rivalry also increases physiological arousal (heart rate and skin conductance).

3.4.4. Heterogeneity

Performance in contests decreases when contestants have more heterogeneous task abilities (Sunde, 2009). Such heterogeneity has also been shown to affect unethical behavior. Some evidence comes from the study of soccer matches: in two separate studies, Deutscher and colleagues studied the effect of heterogeneity (operationalized as the difference in the number of goals scored per team) on sabotage, which they operationalized as the number of yellow and red cards each team received for unsporting behavior (Deutscher et al., 2013; Deutscher & Schneemann, 2017). Both studies found that the goal difference was negatively related to sabotage; that is, that sabotage decreased when the difference in performance between the contestants increased. Similar results were obtained by Frick et al. (2008) as well as Brown and Chowdhury (2017). This suggests that sabotage is reduced when it is unlikely to affect an

actor's own rank or chances of winning. At the same time, of course, this means that sabotage becomes more likely when the contestants are closer in terms of rank or ability.

Organizers of contests have an interest in homogeneous competitors as close contests should yield higher performance of the participants (Lazear & Rosen, 1981). One way they achieve such homogeneity is to handicap the stronger competitors or determine quotas for disadvantaged competitors (Banerjee, Gupta, & Villeval, 2018; Brown & Chowdhury, 2017). In their field study on horse races, Brown and Chowdhury (2017) find that handicap contests are associated with higher sabotage levels, and that this is not due to handicapping itself, but due to the higher homogeneity of competitors. On the other hand, Banerjee et al. (2018) could not demonstrate significant differences in cheating or sabotaging when a disadvantaged group (the Scheduled Casts in India) was granted a quota of winner prizes in a contest.

To manipulate task ability in the lab, Harbring et al. (2007) divided competing participants into "favorites" and "underdogs." For favorites, the costs of effort were low, while for the underdogs they were high. Results suggest that sabotage decreases when favorites outnumber underdogs (one underdog vs. two favorites). The outnumbered underdogs choose to save costs, as their chances of winning become very low. At the same time, the favorites who form the majority feel superior and less threatened by the underdogs (Harbring et al., 2007).

In sum, the literature suggests that unethical behavior in contests increases when participants are more similar in terms of ability or chances of winning. Of course, the effect of heterogeneity on sabotage can only show when contestants are aware of each other's abilities (Gürtler et al., 2013).

3.4.5. Current rank

Based on a series of scenario studies, Vriend et al. (2016) suggest that unethical behavior is particularly high among individuals who compete for the top ranks rather than for middle or bottom ranks. The effect does not depend on a reward for the winner—the top ranks' intrinsic value is sufficient to stimulate unethical behavior. However, adding reward to top ranks and punishment to the bottom ranks makes individuals who compete for the bottom ranks act even more unethical than those competing for top ranks. Thus, an imminent punishment appears to weigh heavier than a possible reward, and competitors are more likely to employ unethical measures to prevent such punishment (Kahneman & Tversky, 1979). At the same time, people expend most effort when they rank either very high or very low (Gill, Kissová, Lee, & Prowse, 2018).

3.5. Affective state variables

The empirical findings reviewed to this point suggest that the specific design of a contest has an effect on the contestants' ethical behavior and that this effect depends on individual and situational characteristics. In this section we will look at the exact psychological mechanisms through which the behavioral consequences of contests unfold. As we argued earlier in this review, interpreting competitiveness as an individual's affective state at a given moment allows for a more fine-grained explanation of how contests may cause unethical behavior. Previous work suggests that affective responses to external stimuli act as antecedents of behavioral responses (Elfenbein, 2007; Oreg et al., 2016). In the following we will discuss empirical research on state competitiveness and competitive arousal during competition and the role that these play in the relationship between contests and unethical behavior (Figure 1).

3.5.1. State competitiveness

In choosing the term "state competitiveness" we allude to the classic distinction between traits and states in psychology (e.g., Korn, Ascough, & Kleemeier, 1972; Spielberger, 1989; Zuckerman, 1983). While "traits" refer to relatively stable preferences that vary between persons (Hamaker et al., 2007; Steyer et al., 2015), "states" are transient psychological and physiological conditions that vary between different contexts. Trait competitiveness can be understood as part of the person's personality and as a general preference for participating in contests. In contrast, state competitiveness describes a person's competitiveness in a given moment. Trait and state competitiveness are distinct, but not independent concepts. A person's trait competitiveness partly determines his or her state competitiveness in any given moment. This means that someone who scores high in trait competitiveness is expected to display high state competitiveness in contests more often than people who score lower (Endler & Kocovski, 2001; Steyer et al., 2015). Trait competitiveness can thus be understood as a person's average state competitiveness over time.

While trait competitiveness is an established concept, only few papers explicitly refer to state competitiveness (e.g., Bachman et al., 1997; Hartmann & Schreck, 2018; Veldhuizen van Zanten et al., 2002). However, many works imply state competitiveness, which they may describe as, e.g., "the desire to win" (Malhotra, 2010) or "performance orientation" (Kilduff et al., 2016; Murayama & Elliot, 2012). These concepts similarly refer to transient internal states that are induced by competition and directly linked to behavior. Explicitly distinguishing between trait and state competitiveness is particularly important in the

organization context: while trait competitiveness is a stable personality feature, state competitiveness is subject to manipulation, for instance, by changing environmental factors or adjusting the contest attributes. Hence, state competitiveness might be a relevant starting point for controlling employees' behavior in contests.

According to social comparison theory, individuals are constantly making self-evaluations by comparing themselves with similar others (Festinger, 1954). In line with this theory, Garcia et al. (2013) developed a social comparison model of competition. Their model introduces the concept "comparison concerns," which they loosely define as the "desire to achieve or maintain a superior relative position" (Garcia et al., 2013, p. 635). According to these authors, this desire is dependent on the situation; it is thus subject to changes. This is the feature that connects the concepts that we grouped together under the term "state competitiveness." For example, Malhotra (2010) describes the desire to win as a (momentary) willingness to maximize relative payoffs, even at personal costs. Similarly, Kilduff et al. (2016) describe the motivation to win as focusing on one's current rank and on the final outcome of winning in contests, even at the expense of ethical conduct. Another related concept is "performance orientation," which refers to focusing on performance-approach goals in a particular situation (Kilduff et al., 2016; Murayama & Elliot, 2012).

So far, researchers have not examined whether state competitiveness mediates the effect of contest attributes on unethical behavior. However, there is indirect evidence that this may be the case. For example, performance orientation (i.e., state competitiveness) has been shown to mediate the effect of rivalry (a situational variable) on unethical behavior (Kilduff et al., 2016). Other research suggests that the desire to win (i.e., state competitiveness) mediates the effect of group size (a contest attribute) on excessive bidding behavior (Malhotra, 2010). However, there is no direct empirical evidence that state competitiveness or any of the related concepts mediates the effect of competition on unethical behavior.

3.5.2. Competitive arousal

Arousal is a physiological state of alertness, involving the activation of various neural systems (Pfaff, Ribeiro, Matthews, & Kow, 2008; Pribram & McGuinness, 1975). The activation of these systems is related to sensory alertness, mobility, and readiness to respond (Pribram & McGuinness, 1975). Arousal also describes the intensity of an emotion (Posner, Russell, & Peterson, 2005). Similarly, arousal has been argued to determine the vigor and persistence of an accompanying motivated behavior (Pfaff et al., 2008). Generalized arousal

is thought to be valence free—it merely regulates the intensity of an emotion or a behavior. However, the literature also includes more specific forms of arousal states, such as sexual arousal, hunger, and fear (Pfaff et al., 2008). Likewise, a contest specific form—competitive arousal—is thought to play a crucial role in competition (Ku et al., 2005; Nichols, 2012). However, the term is used mainly in economics and psychology literature and lacks a consistent definition and a neurobiological foundation.

Several studies that measured arousal during contests by assessing changes in blood pressure, levels of skin conductance, or heart-rate variability provide evidence that a person's response to competition involves physiological reactions. Veldhuizen van Zanten et al. (2002) conducted a study in which participants played a car-racing game either alone or against an experimenter. The authors' data show that when the participants competed against someone else, their heart rate and blood pressure increased, which indicates heightened arousal. During an auction, Adam, Krämer, and Müller (2015) measured arousal levels of competing bidders using continuous physiological measures (i.e., heart rate and skin conductance) and, additionally, short psychometric scales (i.e., questionnaires). Their data suggest that arousal is heightened during a contest, particularly when time-pressure is high. The authors also demonstrated that competitors need to be real humans (as opposed to computer opponents) for competition to have an effect on arousal. However, increased heart-rate levels and blood pressure during contests may also indicate that subjects experience stress (see Buckert, Schwieren, Kudielka, & Fiebach, 2017).

Arousal in the context of competition is sometimes referred to as "competitive arousal" (e.g., Ku et al., 2005, p. 89). However, this concept has not been consistently defined in the literature. Rauch et al. (1999) conceptualize competitive arousal as a pleasant emotion, much like joy, that may be experienced in the context of athletic success, e.g., upon scoring an important goal in an ice hockey match. Ku et al. (2005) and Malhotra (2010), on the other hand, described it as an adrenaline-laden emotional state that can arise while competing. These authors do not comment on the valence (positive vs. negative) of the emotions that competitive arousal, as they conceptualize it, involves, but specify that it causes irrational and potentially costly behavior, which has negative connotations.[9]

[9] Ku et al. (2005) studied excessive bidding in live and online auctions and in the lab. They suggest that competitive arousal causes overbidding. Competitive arousal is in turn fueled by factors like time-pressure or rivalry (between two similar contestants with a history of encounters in previous contests; Ku et al., 2005).

While the studies we reviewed in this section show that competition is related to arousal, there is no evidence that arousal could serve as a mediator in the effect of competition on unethical behavior. In a more general sense, however, arousal has been argued to underlie any motivated behavior, or, more specifically, that generalized arousal determines the vigor and persistence of a behavior (Pfaff et al., 2008, p. 15). It may be conjectured that, with increasing arousal and thus increasing vigor and persistence, unethical means to achieve their goal become more acceptable to contestants. Studying a more specific form of arousal, Ariely and Loewenstein (2006) did find that sexual arousal leads men to take "heat-of-the-moment" decisions of dubious morality, such as encouraging a date to drink to increase their chance of having sex with her. However, there is a clear lack of research specifically on competitive arousal and its effects on unethical behavior.

One reason for the lack of research on competitive arousal and unethical behavior is that measuring competitive arousal is difficult in practical terms. The most extensive effort to develop an instrument for assessing competitive arousal has been made by Nichols (2012). The 10-item instrument that Nichols (2012) developed is superior to the single-item instrument that Ku et al. (2005) used to assess competitive arousal; however, it fails to reflect the physiological dimension of competitive arousal (Pribram & McGuinness, 1975). Instead, the author focuses on specific types of thoughts, feelings, and beliefs. This shortcoming shows, yet again, that there is still no consensus on how the relatively new concept of competitive arousal should be defined.

Our review of state competitiveness and arousal has made clear that a causal link between state competitiveness and unethical behavior has not been established yet, and that more research is needed to test the effects of this potential link. However, the evidence we have discussed indicates that competition does have an effect on state competitiveness and arousal.

4. Discussion and Research Implications

4.1. Summary of findings

Contests are ubiquitous in today's business context—the best employees are promoted, and rankings are a straightforward way of determining the most productive worker. A weakness of such contests is that they provide incentives to get ahead by cheating and sabotaging other contestants. To efficiently tackle unethical behavior in contests, we need to understand

exactly which variables drive the unwanted behavior. To that end, we consulted the varied literature on unethical behavior in contests.

We compiled a review of empirical research on illegitimate ways of improving one's rank in contests among employees. In the course of our review, we identified and discussed a number of variables that may influence state competitiveness, competitive arousal, and ultimately unethical behavior. The review reveals that there are many variables that need to be considered when studying unethical behavior in contests. More specifically, we identified three clusters of determinants: attributes of the contest, attributes of the person, and attributes of the situation. Moreover, some research indicates possible affective states (competitive arousal and state competitiveness) that help explain how exactly contests can lead to unethical behavior. However, most of those variables have not been researched extensively, many have been treated in just a single study, and for others the evidence is mixed and does not allow for clear conclusions (see Table 2 for an overview). The contest attribute prize spread constitutes an exception to this pattern. Six of seven empirical studies indicate that a larger prize spread is associated with more unethical behavior (e.g., Conrads et al., 2014). This points to the importance of choosing the winner and loser prizes wisely. A more subtle way in which competition affects unethical behavior is by means of framing: simply calling sabotage by its name during the contest or framing the prizes in terms of gains rather than losses may reduce contestants' utilization of sabotage (Harbring & Irlenbusch, 2011; Pettit et al., 2016). On the other hand, research suggests that it does not matter how much the prizes are worth in total (Harbring & Irlenbusch, 2011), or how many individuals participate in the contest (Harbring & Irlenbusch, 2008).

Table 2. Overview of results.

Component		Study	Result
Contest attributes	Number of contestants	Harbring & Irlenbusch 2008	Number of contestants → no effect on "sabotage" (de facto cheating)
	Wage sum	Harbring & Irlenbusch 2011	Wage sum → no effect on sabotage
	Prize spread	Garicano & Palacios-Huerta 2005[a]; Harbring & Irlenbusch 2005; Harbring & Irlenbusch 2011; Falk et al. 2008; Vandegrift & Yavas 2010	Larger prize spread → more sabotage
		Conrads et al. 2014; Feltovich 2019	Larger prize spread → more cheating
		Cartwright & Menezes 2014	Larger prize spread → less cheating
	Transparency	Gürtler et al. 2013	Transparency about others' effort → more sabotage
	Framing	Harbring & Irlenbusch 2011	Calling sabotage by its name → less sabotage
		Pettit et al. 2016	Gain frame → less sabotage (compared to loss frame)
Situation attributes	Organizational culture & climate	Hochstein et al. 2017	Perceived competitive climate → more cheating
		Poujol et al. 2016	Perceived ethical climate → less cheating
	Social category	Charness et al. 2014	Shared social category → more cheating; less sabotage
		Benistant & Villeval 2019	Competitor in vs. out-group → no effect on sabotage or cheating
	Rivalry	Kilduff et al. 2016	Rivalry → more sabotage
	Heterogeneity	Brown et al. 2017; Deutscher et al. 2013[a]; Deutscher & Schneemann 2017[a]; Frick et al. 2008[a]	More heterogeneity → less sabotage
		Harbring et al. 2007	Underdogs are minority → less sabotage
		Banerjee et al. 2018	Heterogeneity → no effect on sabotage or cheating
	Current rank	Vriend et al. 2016	Competing for high ranks → more sabotage

Person attributes	Trait competitiveness (one-dimensional)	Jelinek & Ahearne 2010	More trait competitiveness → more sabotage
		Terpstra et al. 1993	More trait competitiveness → more unethical intent
	Trait competitiveness (two-dimensional)	Mudrack et al. 2012	Ego trait competitiveness → more unethical intent; Task trait competitiveness → more ethical intent
		Beu et al. 2003	Task trait competitiveness → no effect on ethical intent
	Task ability	Schwieren & Weichselbaumer 2010	High task ability → less cheating
		Balafoutas et al. 2012; Deutscher et al. 2013[a]	High task ability → less sabotage
		Vandegrift & Yavas 2010	Task ability → no effect on sabotage
	Gender	Dato & Nieken 2014; 2018; Hartmann & Schreck 2018	Male → more sabotage
		Nieken & Dato 2016; Schreck 2015	Male → more cheating
Affective state	State competitiveness	Kilduff et al. 2016	Rivalry → state competitiveness → unethical behavior
	Competitive arousal	Adam et al. 2015	Time pressure in contest → more arousal
		To et al. 2018	Rivalry → more arousal
		Veldhuizen van Zanten et al. 2002	Competition → more arousal

[a] Studied competition between teams, however, unethical behavior occurs between individuals.

We identified and reviewed a range of person attributes that may further qualify the relationship between competition and unethical behavior. The review has shown that people with certain characteristics are more likely to act unethically in contests. For example, highly competitive people who score high on trait competitiveness, and ego trait competitiveness in particular, have a higher propensity for unethical behavior in contests (Jelinek & Ahearne, 2010; Mudrack et al., 2012; Terpstra et al., 1993). In contrast to ego trait competitiveness, task trait competitiveness has been associated with rather ethical intent (Mudrack et al., 2012). Another attribute that has been widely studied is gender—specifically, male participants in behavioral experiments proved to be more inclined to cheating or sabotaging in contests (e.g., Dato & Nieken, 2014, 2019). A couple of studies suggest that not being good at the task further increases the likelihood of unethical behavior (e.g., Schwieren & Weichselbaumer, 2010). To sum up, the effects of the three person attributes have been replicated with mostly consistent results: not being good at the task, being male, and being highly competitive appear to be associated with unethical behavior to get ahead in a contest.

As a third cluster of determinants we identified attributes of the situation which can mitigate or spur the likelihood of unethical behavior in organizational contests. For example, perceiving the climate at the organization as competitive or believing that it is not possible to win the contest in an ethical manner makes people more likely to cheat (Hochstein et al., 2017; Poujol et al., 2016). A few studies also suggest that there will be more unethical behavior if contestants are fairly equal in terms of abilities or, more generally, their chances of winning (e.g., Brown & Chowdhury, 2017; Deutscher & Schneemann, 2017). The effects of other situation attributes have been considered in experimental studies but mostly not replicated. These studies suggest that when employees compete with an old rival or when they compete for one of the top ranks they are more likely to sabotage their competitors (Kilduff et al., 2016; Vriend et al., 2016). Does unethical behavior occur more often when the competitors share attributes with each other, in other words, if they consider each other being part of the same group? The evidence is rather ambiguous—while Benistant and Villeval (2019) find no effects of shared group attributes, Charness et al. (2014) suggest that being in the same group as the competitors leads to less sabotage but more cheating. Compared to contest or person attributes, the effects of situation attributes on unethical behavior in contests have been studied to a lesser extent. However, the effect of heterogeneity has been replicated a couple of times—unethical behavior appears to be more problematic when competing employees have a similar performance level (e.g., Deutscher et al., 2013).

The competition literature includes various concepts that describe people's affective state in the moment of competition. Yet, those concepts have previously not been discussed as a separate group with a specific role in the effects of competition. We believe that including the affective state of employees during contests is crucial in understanding how competition relates to unethical behavior. Unfortunately, the literature on the relation between affective state during contests with unethical behavior is scarce. As an exception, Kilduff et al. (2016) suggest that competing against a fierce rival fosters unethical behavior, because the actor focuses solely on winning (i.e., a state of ego competitiveness) and fails to critically reflect on how to do that in an ethical manner. Other research indicates that competition is associated with increased arousal levels, particularly under time pressure and when there is a fierce rival among the contestants (Adam et al., 2015; To et al., 2018; Veldhuizen van Zanten et al., 2002). However, more research is needed to substantiate the role of arousal in the effect of competition on unethical behavior.

4.2. Directions for future research

The development of an organizing framework and our systematic review of the empirical literature is not an end in itself. From an organizational design perspective, the literature's findings should allow for a better understanding of when and why competition among employees comes along with unintended behavioral effects. Of course, ethical behavior is not the only concern of managers who organize contests among employees. Contests are implemented with the intent of increasing effort. But as contests can lead to both increased effort and unethical behavior, an evident research question is: how should contests should be designed so that unethical behavior is reduced while maintaining the positive effects on effort? While we focused here on unethical behavior, we occasionally mentioned the effects of the respective variables on productive effort and performance. Comparing the effects on unethical behavior with the effects on performance illustrates that many variables are associated with higher performance as well as more unethical behavior. For example, larger prize spreads or competing with a rival have been shown to increase effort as well as the extent of sabotage (Harbring & Irlenbusch, 2011; Kilduff, 2014; Kilduff et al., 2016). These findings highlight the need for studying performance and ethical behavior outcomes simultaneously. Beneficial performance effects need to be put into perspective and related to potentially harmful effects on ethical behavior. In this final subsection, we identify some directions for future research towards that goal. The section is organized according to our

framework's four main determinants: design of the contest, attributes of the person, attributes of the situation, and affective state.

4.2.1. Attributes of the contest

We believe that the study of contest attributes is most important because these are the parameters that contest organizers may adjust to control unethical behavior. Our review already yielded some insights as to which attributes may have intended and unintended effects. Specifically, there is replicated evidence for the case that prize spread increases effort and unethical behavior at the same time (Conrads et al., 2014; Harbring & Irlenbusch, 2011). Similarly, framing contest outcomes in terms of losses rather than gains is associated with more effort (Hossain & List, 2012) but also more unethical behavior (Pettit et al., 2016). Thus, contest organizers deciding on a prize spread or on gain vs. loss framing are usually trading off increased employee effort against unethical behavior. While it is important for managers to take these decisions knowingly, future research needs to focus more on alternative contest attributes—contest attributes which promise to regulate unethical behavior without compromising effort. A promising starting point may be the study by Gürtler et al. (2013), in which the authors were able to increase effort by reducing the risk of being sabotaged. More specifically, sabotage was reduced when contestants had no information about the competitors' performance. More research is needed to replicate this finding and explore the boundary conditions of removing transparency about the competitors' relative or absolute performance. Also, does reducing transparency about others' performance affect cheating as it seems to affect sabotage? From an economical perspective, it makes relatively more sense for a contestant to cheat than to sabotage when competitors' performance is unknown. While sabotage can only affect one's own rank if the sabotaged competitor happens to rank higher than oneself, cheating can improve one's own rank either way (Konrad, 2000).

Other research suggests that increasing the wage sum and reducing the number of contestants may increase effort while it appears to be unrelated to unethical behavior (Harbring & Irlenbusch, 2008, 2011). However, more research is needed to substantiate these indications. From a practical perspective, the number of contestants would be a particularly interesting parameter because contest designers can adjust it rather easily.

While the effects of contest attributes on effort have been widely researched (Dechenaux et al., 2015), there are still many parameters that have not been studied with respect to their effects on unethical behavior. For example, it is unknown whether being

acquainted with one's competitors decreases unethical behavior. It seems reasonable to believe that friends play fairer with each other than strangers, i.e., ethical behavior increases when players know each other. Previous research suggests that contestants who share a social group with the competitor are less likely to sabotage that competitor, while they are more likely to cheat (Charness et al., 2014). Could the degree of acquaintance with the competitor have similar effects? Related to this question, research may want to study whether liking of the other person plays a role in ethical behavior (this would be an attribute of the situation). Of course, the effects have to be evaluated in light of potential performance effects. From a practical perspective, acquaintance is a contest parameter that is adjustable only in one direction, i.e., contest organizers could make sure that contestants know each other, however, it would be less feasible to prevent prior acquaintance of contestants.

Another topic that has not been studied so far is the dimension of the task that is worked on as part of the contest. For example, does competing on a larger or more complex task affect unethical behavior in the same way as competing on multiple smaller or less complex tasks?

4.2.2. Attributes of the person

Our review has shown that men sabotage competitors more often than women. There is a lack of research on the effect of gender on cheating in contests. In contrast to cheating, sabotage is directed at specific victims, and therefore contains an element of aggressiveness. Aggressive behavior is generally more common among men than among women (Archer, 2004). The question arises, if men and women might prefer different kinds of unethical behavior. Future research needs to investigate whether cheating might be the women's preferred illegitimate way of gaining an advantage over their competitors.

Another person attribute associated with unethical behavior in contests is trait competitiveness (e.g., Jelinek & Ahearne, 2010). However, if we take a more detailed look and differentiate between ego and task trait competitiveness, existing evidence indicates that it is only ego competitiveness that causes unethical behavior. For task trait competitiveness, the picture looks less clear, as one study suggests that task trait competitiveness actually increases ethical behavior and another study finds no effect (Beu et al., 2003; Mudrack et al., 2012). More research is needed to clarify whether task trait competitiveness leads to more ethical behavior.

One characteristic that has not received attention in the domain of competition is people's achievement motivation (Elliot, 1999). The achievement motivation literature

differentiates two dimensions that share some characteristics with two-dimensional trait competitiveness: While people with *performance* goals focus on demonstrating competence in comparison to others, people with *mastery* goals focus on demonstrating competence in comparison to their own previous performance. Van Yperen, Hamstra, and van der Klauw (2011) suggest that performance goals are associated with the intent to cheat more than mastery goals—this parallels the results suggesting that ego trait competitiveness is associated with unethical intent more than task trait competitiveness (Mudrack et al., 2012). In addition to the performance–mastery dichotomy, the achievement goal literature differentiates between approach and avoidance orientation (Elliot, 1999). Murayama and Elliot (2012) suggest that competition causes both approach and avoidance goals, which then have opposite effects on task performance—approach goals appear to increase performance while avoidance goals appear to decrease performance. So far, there is no research on the effects that approach versus avoidance orientation has on unethical behavior. Could people's approach orientation prevent unethical behavior? Do people with avoidance-goals employ unethical behavior to compensate for their generally lower performance? Research on these questions could yield valuable contributions to our understanding of the psychological underpinnings of unethical behavior in contests.

4.2.3. Attributes of the situation

The reviewed studies suggest that some attributes of the situation lead to more effort as well as more unethical behavior. Specifically, competing with a rival leads to higher effort and sabotage (Kilduff, 2014; Kilduff et al., 2016) and competing for the top ranks is associated with effort and sabotage (Gill et al., 2018; Vriend et al., 2016). An attribute that has not been researched so far is the choice that people had in becoming contestants. Some research designs include conditions in which subjects are placed in a contest versus conditions in which subjects can choose to participate in a contest (Niederle & Vesterlund, 2007). An interesting avenue for future research is studying the effects of the voluntariness with which people become contestants. It may be the case, that employees cheat more when the contest is imposed onto them by their supervisors, as compared to contests that the employee participates out of his or her own motivation.

4.2.4. Two-dimensional conceptualization of state competitiveness

In our review we discussed two-dimensional conceptualizations of *trait* competitiveness: ego trait competitiveness and task trait competitiveness. Here we propose that future research

should make a corresponding distinction between two dimensions of *state* competitiveness: ego state competitiveness and task state competitiveness. We believe that this distinction is necessary because it helps explain under which circumstances a contest increases effort without also increasing unethical behavior.

Task state competitiveness refers to an agent's momentary, situationally dependent focus on personal development in a given contest, i.e., on the degree to which the agent perceives the contest as an opportunity to improve his or her mastery of the task. In contrast, when ego state competitiveness is the dominant motive in a contest, the agent's focus lies on his or her performance relative to that of competitors. In the latter case, outperforming others and winning the contest becomes a goal in itself, instead of indicating the extent to which the agent has mastered the task. In contrast to trait competitiveness, state competitiveness is situationally contingent, i.e., the specific design of a contest may determine which motive becomes dominant—task or ego competitiveness.

We are not the first to propose this idea. In her early work on human cooperation and competition, Mead (1961, p. 17) acknowledged that different situations influence how people perceive things and lead them to focus on either achieving their goals (i.e., *task* state competitiveness) or on their competitors (i.e., *ego* state competitiveness). More recently, Hartmann and Schreck (2018) distinguished between two dimensions of competitiveness and argued that different forms of competition affect the relative importance and salience of both dimensions, which in turn affect unethical behavior. Other research refers to two-dimensional state competitiveness more implicitly. For instance, Malhotra (2010) measured the "real-time motivations of online auction bidders" in terms of "competitive motivation" (i.e., *task* state competitiveness) versus a "desire to win" (i.e., *ego* state competitiveness).

Conceiving state competitiveness as a two-dimensional rather than a one-dimensional concept may be more useful for the purpose of reducing unethical behavior because it allows researchers to disentangle distinct and potentially contradictory effects. For example, one advantage of the two-dimensional concept of trait competitiveness is that it captures the contrary effects that these dimensions have on unethical behavior. While ego *trait* competitiveness leads to unethical behavior (Mudrack et al., 2012), task trait competitiveness is unrelated or even negatively related to unethical behavior (Beu et al., 2003; Mudrack et al., 2012). We would expect the same to apply to the case of ego and task *state* competitiveness. Specifically, ego state competitiveness should be associated with unethical behavior, because cheating and sabotage help the actor win a specific contest. In contrast, we expect task state competitiveness to be unrelated to unethical behavior because cheating and sabotage do not

help the actor improve his or her mastery of a given task. There is some empirical support in that direction: Sage and Kavussanu (2007) manipulated subjects' task involvement versus ego involvement in a table soccer contest and measured the players' moral behavior. Ego and task involvement were manipulated by providing respective cues (such as stressing winning versus learning) in the description of the task that subjects saw prior to the contest. The results suggest that ego involved individuals display more antisocial behavior whereas task involved individuals take more prosocial choices.

In order to gain a profound understanding of the antecedents and consequences of ego and task state competitiveness, future research needs to develop an appropriate measurement instrument for two-dimensional state competitiveness. Such an instrument does not yet exist but would be a prerequisite for empirically testing the effects of the two dimensions of state competitiveness on unethical behavior. It is possible that the terminological imprecision surrounding competition has impeded the development of appropriate measurement instruments.

Lastly, the two-dimensional concept of state competitiveness may provide contest designers with another way of minimizing unethical behavior without affecting effort. Specifically, contest designers would need to foster task state competitiveness and reduce ego state competitiveness (cf. Murayama & Elliot, 2012). Future research could explore these options in depth.

5. Conclusion

We reviewed the empirical literature on contests and unethical behavior in organizations. The reviewed literature suggests that unethical behavior is largely determined by three components, namely attributes of the contest, attributes of the person, and attributes of the situation. Some of the respective variables have been replicated multiple times—those are the factors that organizations should consider when designing their contests. For example, a large prize spread is likely to increase occurrence of unethical behavior. Also, a heterogeneous group of contestants is likely to reduce unethical behavior. In terms of person attributes, being male, being highly competitive, and having low ability to complete the task increases the likelihood of unethical behavior. For practitioners, the latter mentioned attributes of the situation and the person are likely to be less applicable because those factors are not easily manipulated among employees. While the reviewed literature includes concepts of affective state (competitive arousal and state competitiveness), the role of those concepts in the effect

of competition on unethical behavior has barely received attention in existing research. However, in order to study the role of, for instance, state competitiveness empirically, valid measuring instruments need to be developed first. In organizing the reviewed literature, we developed a simple framework which resolves the ambiguous use of terms such as "competition" or "competitiveness". Moreover, the framework may be used to develop specific and testable research models and hypotheses. Specifically, future research may compare the effectiveness of different attributes or combinations thereof in order to determine the most advantageous trade-off between effort and unethical behavior.

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CHAPTER 3

Development and Initial Validation of a State Competitiveness Scale

Abstract

Competitiveness is usually understood as a stable trait. In contrast, this research conceptualizes a state form of competitiveness that is reflecting situational variations in competitiveness. Congruent with two-dimensional accounts of trait competitiveness, state competitiveness comprises the dimensions ego and task competitiveness. While ego state competitiveness involves a focus on winning and demonstrating superiority, task state competitiveness reflects the desire to grow and personally develop in the contest.

To facilitate empirical research on state competitiveness I develop a brief self-report instrument for utilization in laboratory settings. Data are collected in three online studies on the Amazon mTurk platform. In Study 1 ($N = 199$) the scale is reduced to ten items by means of exploratory factor analysis. Study 2 ($N = 80$) establishes convergent validity by means of correlation with trait competitiveness scales. Study 3 ($N = 206$) follows an experimental design to establish divergent validity as well as factorial validity by means of confirmatory factor analysis. I discuss some research questions that may be addressed with the new instrument.

1. Introduction

Understanding the concept of state competitiveness and the need for a new measurement instrument is best understood by the example of unethical behavior in contests. Unethical behavior, or more specifically, sabotage and cheating, is a common problem in contests (Charness, Masclet, & Villeval, 2014; Preston & Szymanski, 2003; Schwieren & Weichselbaumer, 2010). It may occur in promotion tournaments, sales contests, or other forms of competition (Charness et al., 2014; Chowdhury & Gürtler, 2015; Preston & Szymanski, 2003). As unethical behavior is usually an undesired effect of competition, researchers are trying to pinpoint the underlying causes for such behavior (e.g., Cartwright & Menezes, 2014; Deutscher & Schneemann, 2017; Hartmann & Schreck, 2018; Pettit, Doyle, Lount, & To, 2016). Fully understanding these mechanisms is necessary in order to design contests in a way that minimizes temptations to engage in cheating or other adverse behavior.

One factor that might serve this purpose is state competitiveness, or more precisely: ego and task state competitiveness (Hartmann & Schreck, 2018; Malhotra, 2010). Both versions of state competitiveness describe a person's motivation during a specific contest—it may thus vary from one situation to another. More specifically, ego state competitiveness refers to the momentary focus on winning, beating the competitor, and demonstrating one's own superiority. Task state competitiveness, on the other hand, refers to the momentary focus on improving one's skills, taking the opportunity to personally develop in the contest, and enjoy the task. People in a state of ego competitiveness like to compete just as much as people in a state of task competitiveness, only for different underlying reasons. The different reasons, however, affect unethical behavior differently, too. When the primary goal during competing is to win, cheating is a rational strategy of achieving that goal. In contrast, when the primary goal in the contest is to improve and develop personally, cheating does not promote goal attainment and thus becomes irrational (Sage & Kavussanu, 2007). Taken together, thus, ego state competitiveness could be a reason for unethical behavior in contests (Ring & Kavussanu, 2018a).

Testing links such as the one between ego state competitiveness and unethical behavior requires a valid way of measuring the concept. But even though ego and task SC are no new concepts (Malhotra, 2010), there is no validated instrument for measuring them (Hartmann & Schreck, 2018). Therefore, the goal of this research is the development of a valid instrument for assessing ego and task state competitiveness.

2. Theoretical background and related research

2.1. Ego and task trait competitiveness

Competitiveness is traditionally conceptualized as a character disposition and therefore sometimes called trait competitiveness (Fletcher & Nusbaum, 2008; Harris & Houston, 2010; Newby & Klein, 2014). A large part of the literature distinguishes between two forms of trait competitiveness (Hartmann & Schreck, 2018; Houston, McIntire, Kinnie, & Terry, 2002; Ryckman, Libby, van den Borne, Gold, & Lindner, 1997; Tassi & Schneider, 1997). While these two forms have been referred to with various terms in the past, there is considerable overlap in the concepts (Houston et al., 2002). I will refer to the two dimensions as ego and task trait competitiveness (Chapter 2; Nicholls, 1989).

Ego trait competitiveness (ego TC) refers to someone's desire to win and validate one's superiority over others (Houston et al., 2002; Tassi & Schneider, 1997). It involves hostility towards other competitors, who are considered to be enemies that must be eliminated (Horney, 1936; Ryckman, Hammer, Kaczor, & Gold, 1990). In ego TC, winning is the primary goal on its own. In contrast, task trait competitiveness (task TC) involves the enjoyment of competition and the motivation to master a task, thereby experiencing personal growth (Ryckman, Hammer, Kaczor, & Gold, 1996). The focus is not on the devaluation of others to enhance self-worth—instead, competitors are seen as helpers who provide opportunities for personal learning and discovery (Ryckman et al., 1997). In task TC, the primary goal is to improve oneself and competition constitutes an indicator of success in this task (Houston et al., 2002; Tassi & Schneider, 1997). Table 1 provides an overview of characterizations of ego and task TC.

Note that competitiveness can also be understood as a one-dimensional concept—in that case, it reflects someone's general preference for competing (Bönte, Lombardo, & Urbig, 2017; Fallucchi, Nosenzo, & Reiben, 2019). Other work adopted factor analysis results and devised competitiveness as a multi-dimensional construct (Franken & Brown, 1995; Newby & Klein, 2014).

Table 1. Characterizations of ego and task trait competitiveness.

	Description	Original term	Reference
Ego trait competitiveness	– Feeling powerful – Feeling superior – Competitors are seen as obstacles or enemies – Need to compete and win at any cost – Manipulation, aggressiveness, exploitation, and denigration of others – Derogation of others to enhance the self	Hypercompetitiveness	Ryckman et al. (1990, 1996)
	– Desire to win, often at the expense of others – Validating own superiority and inferiority of others	Self-aggrandizement	Houston et al. (2002)
	– Outdoing one's peers – Prove superiority to others	Other-reference competition	Tassi and Schneider (1997)
Task trait competitiveness	– Primary focus on enjoyment and mastery of the task rather than winning – Self-discovery, self-improvement, and task-mastery – Others are seen as helpers who provide the individual with personal discovery and learning opportunities – Winning and being successful, but not at the expense of others	Personal development competition orientation	Ryckman et al. (1996)
	– Improve oneself; winning is not of utmost importance – A neutral, less denigrating view of others and emphasize the benefits of competitiveness	Interpersonal success	Houston et al. (2002)
	– Focus on becoming competent – Competition serves as the gauge of success at the task	Task-oriented competition	Tassi and Schneider (1997)

2.2. Ego and task state competitiveness

While trait competitiveness surely helps understanding and predicting people's behavior, behavior depends just as much on situational factors (Buss, 1977; Treviño, 1986). The competitiveness we experience changes from time to time and specific situations may stimulate competitiveness more than others. Thus, there is a difference between the more general, stable trait of competitiveness, and a more situation specific version of the concept (Hamaker, Nesselroade, & Molenaar, 2007; Steyer, Mayer, Geiser, & Cole, 2015). This idea of situationally dependent competitiveness is reflected in the concept state competitiveness (Bachman, Brewer, & Petitpas, 1997; Hartmann & Schreck, 2018).

Trait and state competitiveness are not independent of each other—a person's state competitiveness in a given moment is partly determined by that person's trait competitiveness (Hamaker et al., 2007; Steyer et al., 2015). In addition, state competitiveness depends on situational variables. Examples for situational variables that have been studied in this context include the rules of a contest, the competitive climate in the environment, or the contest's prize (Fletcher, Major, & Davis, 2008; Harbring & Irlenbusch, 2011). Taken together, thus, a person's state levels revolve around that person's trait level (Hamaker et al., 2007). This means, that a person who is high in trait competitiveness tends to experience, on average, rather high levels of state competitiveness—compared to a person who is low in trait competitiveness. At the same time, it means that specific situation characteristic may increase or decrease people's state competitiveness.

In line with the outlined understanding of state and trait competitiveness, the concepts are largely congruent, with the only difference being the period to which they refer (Hamaker et al., 2007). That is, the ego–task differentiation applies to state competitiveness as much as it does for trait competitiveness. I therefore differentiate between ego state competitiveness and task state competitiveness (ego and task SC, respectively). Ego SC can be defined as someone's current focus on winning a contest in order to demonstrate his superiority and the others' inferiority. Task SC, on the other hand, can be defined as someone's current eagerness to self-improve or to personally develop by competing with others. The characterizations of ego and task SC are not new—they are based on existing accounts of ego and task TC and adjusted so that they refer to a specific situation (see Figure 1).

The distinction between ego and task SC may be traced back to a series of studies on indigenous tribes that was first published in 1937 (Mead, 1961). Mead differentiates between

competition and rivalry. Competition involves behavior aimed at achieving a goal where the other competitors are secondary—this basically corresponds to the concept of task SC. Rivalry, as Mead argues, is primarily aimed at beating another human while largely disregarding the task in question—this corresponds to the concept of ego SC. Note that Mead describes the situations rather than the corresponding states.

A similar distinction is made in the literature on achievement goals, namely ego and task involvement (Nicholls, 1989; Ring & Kavussanu, 2018a, 2018b; Standage, Duda, & Pensgaard, 2005). In that literature, ego involvement refers to the situational focus on demonstrating better performance than others, while task involvement refers to the situational focus on improving one's personal performance. Note that, in contrast to state competitiveness, goal involvement does not necessarily implicate competition. The relation between state competitiveness and goal involvement may be characterized as follows: ego/task state competitiveness equals ego/task involvement in a competition context. The similarity of both literatures is further exemplified by the fact that the achievement goal literature makes a distinction between goal involvement and goal orientation, which corresponds to the state–trait distinction in competitiveness (Nicholls, 1989; Ring & Kavussanu, 2018b).

An early explicit reference to state competitiveness is made by Bachman et al. (1997), who distinguish between trait competitiveness (dispositional) and state competitiveness (situational). More recently, other authors followed in acknowledging the two-dimensionality of state competitiveness. For instance, Malhotra (2010) draws on the differentiation by Mead (1961) and labels the corresponding ego and task SC concepts "desire to win" and "competitive motivation," respectively (p. 140). Similarly, Hartmann and Schreck (2018) distinguish between rivalry and task focus, corresponding to ego and task state competitiveness, respectively.

As elucidated in the previous paragraphs, the basic idea of state competitiveness—and even two-dimensional state competitiveness—is not new. Nevertheless, it remains a rather infrequently used concept and it has never been discussed in a comprehensive manner before. I argued at the beginning of this article that state competitiveness might be an important concept that helps explaining unethical behavior during contests—it should therefore be studied more. For this purpose, a valid way of measuring ego and task SC is indispensable. The literature on state competitiveness measurement is hence briefly reviewed in the following section.

2.3. Measurement of ego and task state competitiveness

A dichotomous behavioral measure of state competitiveness is regularly used in economics experiments (e.g., Niederle & Vesterlund, 2007). The behavioral measure involves giving experimental participants the choice of being remunerated on an individual basis or on a relative-performance basis, that is, competition (e.g., Niederle & Vesterlund, 2007). Choosing competition over individual incentives is interpreted as competitiveness (Bönte et al., 2017). A more nuanced version has been developed by Saccardo, Pietrasz, and Gneezy (2018). These authors let participants choose what proportion of their payment should be based on relative performance vs. absolute performance, yielding 101 levels of competitiveness. Both behavioral measures assess competitiveness in a specific situation—hence they arguably assess state competitiveness rather than trait competitiveness (Bönte et al., 2017). Other authors have used self-report instruments to assess state competitiveness in field studies. For example, Malhotra (2010) asked bidders during an auction "Item value aside, how important is 'winning' (beating other bidders) to you?" (p. 141). Similarly, Bachman et al. (1997) assessed athletes' state competitiveness with a self-report item administered right after cross country runs. In sum, neither existing self-report nor behavioral measures of state competitiveness discriminate between task and ego dimensions.

Research on achievement goals measures ego and task involvement with self-report items (Ring & Kavussanu, 2018a, 2018b; Sage & Kavussanu, 2007; Standage et al., 2005). For example, Sage and Kavussanu (2007) used a questionnaire with seven items for task involvement (e.g., "In today's experiment trying hard to improve was important", p. 196) and seven items for ego involvement (e.g., "In today's experiment doing better than the other players was important", p. 196).

To this day, however, there is no instrument for assessing ego and task SC (Hartmann & Schreck, 2018). My aim is to address this gap by developing a short self-report instrument for assessing ego and task SC and provide first evidence of the instrument's construct validity. To that end, I follow scale development procedures as recommended by Hinkin (1998). Study 1 contains the scale development by means of exploratory factor analysis. Study 2 provides evidence of convergent validity. Lastly, in Study 3, I confirm the factor structure by means of confirmatory factor analysis and report evidence of discriminant validity for ego SC.

3. Study 1: Scale Development

In generating the items, I take a deductive approach, that is, items are generated in line with the construct definitions as discussed in the previous section (Hinkin, 1998). A large part of the initial item pool is generated by rewording items from established trait competitiveness scales, so that they refer to a specific situation rather than general preferences. Other authors have successfully used this approach to convert trait scales into valid scales measuring the corresponding states (e.g., Farrar & Krcmar, 2006; Heatherton & Polivy, 1991). Hence, to generate items for measuring ego SC, I adapt items from the Hypercompetitive Attitude Scale (Ryckman et al., 1990), the Desire to Win subscale of the Competitiveness/Mastery Questionnaire (Franken & Brown, 1995), and the Dominance subscale of the Competitiveness Orientation Measure (Newby & Klein, 2014). Likewise, to generate items for measuring task SC, I adapt items from the Personal Development Competitive Attitude Scale (Ryckman et al., 1996), the Improving Performance subscale of the Competitiveness/Mastery Questionnaire (Franken & Brown, 1995), and the Personal Enhancement subscale of the Competitiveness Orientation Measure (Newby & Klein, 2014). In addition, I devise new items to capture aspects which are not yet represented by the converted items (e.g., “I want the others to lose now”).

Some may argue that items must be phrased in neutral terms, avoiding words such as “contest” or “competition”. However, note that participating in a contest is a prerequisite for experiencing ego or task SC. The scale’s ideal application context is right before or during a contest. Research participants in the respective studies are usually well aware of their role as contestants. Therefore, appearance of competition terms should not pose a threat to the scale’s validity and thus I do not replace these terms with more neutral and ambiguous ones.

The resulting item pool comprises 85 items (50 for ego and 35 for task SC). The number is intentionally large to reduce the likelihood of missing important aspects. As Clark and Watson (1995) put it, weak and unrelated items can be identified by statistics, however, there is no method for identifying missing items. The items are provided in Appendix A.

Upon reviewing this initial item pool I delete items when they are redundant (i.e., two or more highly similar items), when they are ambiguous (e.g., double-barreled items; Hinkin, 1998), when they are not unequivocally attributable to either ego or task SC, when they are not accurately reflecting either ego or task SC as defined above, or when they are complex and difficult to understand. Moreover, I delete items that are framed in terms of avoiding failure rather than approaching success, in order to prevent that the scale could be

confounded by approach vs. avoidance motivation (Elliot, 1999) or gain vs. loss framing (Tversky & Kahneman, 1981). A summary of the deletions is included in Appendix A.

The remaining item pool comprises 33 items (17 for task SC and 16 for ego SC). These items are independently reviewed by a panel of three graduate students to confirm content validity and to make revisions in order to further improve comprehensibility.

The goal of Study 1 is to further reduce the number of items by means of exploratory factor analysis. More specifically, I aim at a brief scale with five items for measuring ego and task SC, respectively, with an alpha between .80 and .90 for each subscale (Clark & Watson, 1995; Newby & Klein, 2014). A concise scale is particularly important for measuring situationally dependent states, as a state might fade in the course of completing a long questionnaire. A scale of ten items is short enough to be administered during a contest. As the ego and task SC are usually considered in tandem and as they constitute specific forms of more general state competitiveness, ego and task SC are reflected in two subscales of one instrument, rather than two separate instruments (Watson, Clark, & Tellegen, 1988).

3.1. Materials and Methods

The remaining 33 items are administered to a sample of 199 subjects (103 women, 96 men) recruited from the online platform Amazon Mechanical Turk. Being an American resident is a prerequisite for participating in the study. Participants are between 21 and 73 years old, with a mean age of 37 (*sd*=11). All participants give informed consent to the study.

Subjects' answers may be biased towards more socially desirable answers (Nederhof, 1985). To rule out this possibility for the current sample, participants complete the Social Desirability Index (SDS-17; Newby & Klein, 2014; Stöber, 2001).

To provide participants with a setting and put them in a competitive state, they are asked to read a scenario description of a contest and envision participating in that contest. Previous research has successfully employed this approach in developing scales for situationally dependent concepts (Nichols, 2012). Participants are given one out of three possible scenarios—all of them involve an actor who participates in a contest with a number of colleagues. The scenario descriptions are provided in Appendix B. After reading and envisioning the scenario, subjects complete the 33 state competitiveness items. The items are answered in three blocks and subjects are reminded of the scenario between the blocks. Responses are submitted on 7-point answer scales ranging from "completely disagree" to "completely agree" (Matell & Jacoby, 1972). Lastly, subjects complete the SDS-17, are

debriefed, and are given the chance to leave comments in a textbox. Completing the study takes an average of 15 minutes, and subjects receive $2.25 for their participation.

3.2. Results and Discussion

3.2.1. Exploratory Factor Analysis

The 33 items are submitted to an exploratory factor analysis to examine the extent to which items fall into the two factors ego and task SC, as well as to reduce the number of items. Factors are extracted based on the principal-factor estimation method (Worthington & Whittaker, 2006). In line with the two-dimensional account of state competitiveness, the maximum number of factors to be retained is restricted to two—corresponding to ego and task SC. A scree test yields support for the two-factor structure (Cattell, 1966; the scree plot is provided in Appendix C).

To ease interpretation of the components, I employ promax rotation. As an oblique rotation method, promax allows the factors to be correlated. A correlation of ego and task SC is expected as both indicate a motivation to exert effort in contests. Indeed, the retained factors at this point correlate with $r = .27$. The rotated factor loadings of the 33 items are depicted in Appendix D (top panel).

The item reduction procedure is completed in two phases. In the first phase, I delete items that appear grossly misplaced in terms of factor loadings and cross-loadings. I remove three items that load on the wrong factor, six more that have high cross-loadings, and three items due to overall low loadings. This yields a promax-rotated solution in which all 21 items (11 task and 10 ego) load between .6 and .8 on the target factor and between –.2 and .2 on the other factor (see Appendix D, middle panel). While this is a satisfactory factor structure, the goal is to develop a shorter scale. Therefore, more items are deleted in a second phase of item reduction.

In the second phase of item reduction, I consider not only factor loadings but also item content. Deleting items solely on the basis of factor loadings would yield a highly reliable scale, however, the retained items would be likely to be redundant, thereby compromising the scale's validity (Clark & Watson, 1995). Hence, I delete one item at a time and examine the plot of rotated factor loadings after each deletion. At the same time, I consider, for example, deleting items that are rather similar in content. The result of this stepwise item-deletion procedure is a 10-item scale with 5 items per factor, as outlined in Table 2. As stated earlier, a scale length of five items per factor is appropriate for a simple

concept such as ego/task SC (Clark & Watson, 1995). The rotated factor loadings are displayed in Table 2 and graphically plotted in Appendix D (bottom panel).

Table 2. Rotated factor loadings of the final solution.

Item		Factor 1: Task SC	Factor 2: Ego SC
(12)	My goal today is to get better than I was before.	.78	
(17)	I see this contest as a possibility to prove something to myself.	.74	
(22)	This activity helps me to develop my abilities.	.83	
(26)	I value the other contestants for motivating me to bring the best out of myself.	.69	
(33)	I find this competition a valuable means of learning about myself and others.	.74	
(39)	A success would be to do better than the others rather than just getting a good result.		.74
(51)	I enjoy beating the others in this.		.73
(58)	Right now, winning is the most important thing to me.		.78
(59)	I want the others to lose now.		.64
(81)	Success in this task would make me feel superior to the others.		.76

Note: Factor loadings < |.15| are omitted. Rotation method: oblique promax.

The ego and task SC subscales display good internal consistencies (*alpha* = .86 and 88, respectively). All average interitem correlations for the two scales fall between .52 and .62, suggesting appropriate unidimensionality of the two subscales (Clark & Watson, 1995). The task and ego SC factors correlate with $r = .29$. The positive correlation suggests a slight tendency for people who experience either ego or task SC tend to experience the respective other form as well. This is only a small tendency; the correlation coefficient is not particularly large. Nevertheless, it is worthwhile noting what is *not* shown, namely a negative correlation. Experiencing ego SC does not imply that task SC is absent. This result is interesting in view of the fact that previous research does not agree on the correlation between ego and task TC. In this study, ego and task TC correlate positively (see also Tassi & Schneider, 1997), however, other studies find a negative (Franken & Brown, 1995) or no correlation (Ryckman et al., 1997). Again, for ego and task SC as measured in this study, there is a very small positive correlation.

To sum up, the exploratory factor analysis yields a brief and face valid instrument for measuring ego and task SC. Five of the retained items represent the key aspects of ego SC, i.e., the emphasis on winning, a need to demonstrate superiority, and a denigrating view of the opponent. The other five items represent the key aspects of task SC, i.e., an emphasis on personal improvement, ascribing meaningfulness to the task, and an appreciation of the competitors. While the factor structure appears to be face valid, this should be empirically substantiated with a confirmatory factor analysis based on a new sample (DiStefano & Hess, 2005; Worthington & Whittaker, 2006). This will be addressed in Study 2.

3.2.2. Social desirability

As is customary in scale development, I check whether answers to the state competitiveness scale are biased by socially desirable responding (Stöber, 2001). There is no significant correlation between social desirability and the ego SC subscale. For task SC, there is a significant but very small correlation of $r = .16$ ($p < .05$). Like Newby and Klein (2014), I also verify that each state competitiveness item correlates higher with its scale (task or ego SC, correlations between .75 and .87) than with social desirability (all correlations < |.2|). Taken together, thus, the answers to the state competitiveness items do not appear to be driven by social desirability concerns.

4. Study 2: Confirmation of factor structure and first evidence of convergent validity

The goal of Study 2 is to confirm the factor structure in a new sample and to provide first evidence of construct validity, i.e., evidence for the case that the scale is indeed measuring ego and state SC. Construct validity is usually argued to comprise two key elements—convergent and discriminant validity (Campbell & Fiske, 1959; Cronbach & Meehl, 1955; Pike, 1992, 2006). Discriminant validity entails that a scale is not measuring a concept which it is not meant to measure. This type of validity will be addressed in Study 3. In the present study, the focus lies on convergent validity. Convergent validity is given when the scale correlates with other scales that are measuring related concepts (Pike, 2006).

State competitiveness is determined in part by trait competitiveness and situational factors (Hamaker et al., 2007). State competitiveness should therefore be positively related with trait competitiveness. Accordingly, the ego and task SC subscales would possess convergent validity if they were correlated with ego and task trait competitiveness (ego and task TC), respectively. To test this, I ask participants to envision the participation in a contest

and to complete the state competitiveness scale as well as two-dimensional trait competitiveness scales. Convergent validity will be demonstrated by means of correlation coefficients.

4.1. Materials and Methods

Eighty subjects (44 females and 36 males) are recruited from the Amazon Mechanical Turk platform. Being an American resident is a prerequisite for participating in the study. Their ages range from 21 to 62 (*mean* = 33, *sd* = 9). Participants complete the study in an average of 20 minutes and receive $2.25 compensation.

After giving informed consent, subjects read a vignette with the description of a sales contest at work. More specifically, subjects are requested to imagine that they are running head to head with a few coworkers and that the contest is about to finish. With this scenario in mind, subjects complete the state competitiveness scale. Afterwards, it is clarified to subjects that the following questionnaires are no longer referring to the contest scenario. Subjects are explicitly asked to return to the "real world" and to answer subsequent items with no specific situation in mind, and that the remaining questions address general attitudes.

Two questionnaires are selected to assess ego and task TC. The Competitiveness/Mastery Questionnaire is selected for its conciseness (Franken & Brown, 1995). The questionnaire consists of a total of five subscales, two of which correspond to ego and task TC—the Desire to Win subscale (5 items) corresponds to ego TC and the Improving Performance subscale (4 items) corresponds to task TC. Subjects complete only those two subscales. The Competitiveness Orientation Measure is selected because it constitutes a recent effort to capture the various aspects of competitiveness in one instrument (Newby & Klein, 2014). The scale consists of four subscales, two of which correspond to ego and task TC—the Dominance subscale (13 items) corresponds to ego TC and the Personal Enhancement subscale (4 items) corresponds to task TC. Again, subjects complete only those two subscales. For the sake of brevity, I will refer to the subscales as ego and task TC with indices FB or NK, to indicate the scale authors Franken and Brown or Newby and Klein, respectively (i.e., ego and task TC_{FB}, ego and task TC_{NK}.

4.2. Results and Discussion

As in Study 1, visual inspection of the histograms and normal probability plots suggests that the answers to most of the items are distributed right-skewed. Item 9 ("I want the others to lose now") appears to be an exception—a Shapiro-Wilk test cannot reject the hypothesis that responses come from a normally distributed population ($W = .98$, $p = .43$). For the other nine items the Shapiro-Wilk tests suggest that the answers deviate significantly from normality ($.81 < W < .96$, $2.12 < z < 5.66$, all $p < .05$). The non-normality will be accounted for in the CFA by applying the Satorra–Bentler correction (Satorra & Bentler, 1994).

4.2.1. Confirmatory factor analysis

Following common scale development conventions, I conduct a confirmatory factor analysis (CFA) to assess data fit of the two-factor model in the new sample and to compare the solution to an alternative model (Kline, 2005). The goal of the CFA is to support the proposed factor solution.

Stata's structural equation modeling feature is used to estimate a standardized measurement model by means of the maximum likelihood method. Task and ego SC are defined as latent factors and they are allowed to correlate by estimating the covariance between them. The ten items serve as the corresponding indicators. A path diagram depicting the measurement model is provided in Figure 1.

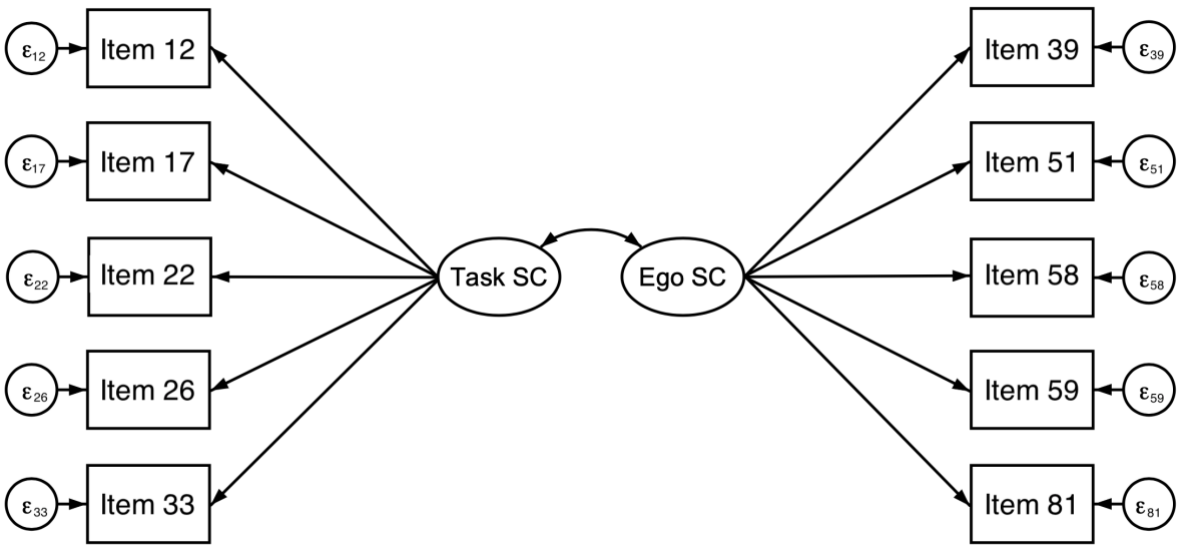


Figure 1. Measurement model of the state competitiveness scale.

To account for the non-normality of the data, the standard errors are adjusted with the Satorra–Bentler correction (Kline, 2005; Satorra & Bentler, 1994). All indicators load on the predicted latent factors. More specifically, standardized factor loadings (i.e., path coefficients) range from .60 to .87, with all loadings being significant at the .001 level. The covariance between the two factors amounts to .26 (p = .062). As the model was standardized, the variance of the factors is set to 1.00, so the covariance equals the correlation between the factors. With a p-value of .062, the correlation may be called marginally significant.

Various classes of goodness-of-fit indices are used to evaluate model fit. I follow recommendations by Kline (2005) to report χ^2, the root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the standard root mean squared residual (SRMR). Commonly reported cutoffs for acceptable goodness-of-fit indices include a non-significant χ^2, RMSEA < .06, CFI > .95, and SRMR < .08 (Hu & Bentler, 1999). In addition, I provide Akaike's Information Criterion (AIC). The AIC is used to compare the fit of different models where a smaller value indicates better fit (Worthington & Whittaker, 2006). The χ^2 statistic, RMSEA, and CFI are based on the Satorra–Bentler correction, making the tests more robust to non-normality (Satorra & Bentler, 1994).

Goodness-of-fit indices are provided in Table 3. The χ^2-test is significant, suggesting that the specified model does not fit the data as well as the saturated model. RMSEA, CFI, and SRMR, too, miss their respective critical values for acceptable model fit (Hu & Bentler, 1999; Schreiber, Nora, Stage, Barlow, & King, 2006). This result might be attributed to an overly small sample size (Herzog & Boomsma, 2009). However, applying the Swain-correction to account for small sample sizes does not yield different conclusions: $\chi^2(34)$ = 59.108, p = .005; RMSEA = .096; and CFI = .919 (Antonakis & Bastardoz, 2013; Herzog & Boomsma, 2009; Langer, 2017, 2018; Swain, 1975). Taken together, the present study fails to confirm factorial validity of the two-dimensional state competitiveness scale.

To check whether a one-factor model may fit the data better, confirmatory factor analysis is carried out on the corresponding model (Kline, 2005). That is, all items are assigned to one latent factor. Table 3 provides goodness-of-fit indices for this solution. These values lie beyond acceptable ranges, however. A larger AIC indicates that the one-factor model fits the data even less than the two-factor model. Again, I have to acknowledge that the sample size of 80 may be too small to yield reliable results (Worthington & Whittaker,

Table 3. Goodness of fit indices for the two-factor model and alternative one-factor model.

Goodness-of-fit index	Criteria for good model fit	Study 2 ($N = 80$)		Study 3 ($N = 206$)	
		Two-factor model	One-factor model	Two-factor model	One-factor model
Akaike's information criterion (AIC)	smaller = better	2560.627	2694.485	7194.386	7640.267
Satorra–Bentler scaled χ^2 (model vs. saturated)	$p > .05$	$\chi^2(34) = 62.51$ $p = .002$	$\chi^2(35) = 171.359$ $p < .001$	$\chi^2(34) = 72.54$ $p < .001$	$\chi^2(35) = 416.31$ $p < .001$
Root mean squared error of approximation (RMSEA)	< .06	.102	.221	.074	.230
Comparative fit index (CFI)	> .95	.908	.558	.954	.544
Standardized root mean squared residual (SRMR)	< .08	.112	.214	.066	.218

Note: Standard errors of χ^2, RMSEA, and CFI are based on Satorra–Bentler correction. Criteria for good model fit according to Hu and Bentler (1999).

2006). According to Wolf, Harrington, Clark, and Miller (2013), a CFA of the two-factor model requires a sample size of at least 150. To address this weakness, the CFA will be repeated with a larger sample in Study 3.

4.2.2. Convergent validity

Means, alphas, and correlations are provided in Table 4. All scales show good or excellent internal consistency, with Cronbach's alpha values of .84 or larger. Evidence for convergent validity of the ego and task SC scales is provided by the expected correlations: the ego SC scale correlates with both ego TC scales, with coefficients of .44 and .42. Similarly, the task SC scale correlates with both task TC scales, with coefficients of .52 and .33. All correlations are significant at the .01 or .001 alpha level. Hence, the ego SC subscale can be said to converge with measures of ego TC, just as the task SC subscale converges with measures of task TC. These links are in line with the idea that state competitiveness at any given moment is partly determined by the persons trait competitiveness (Hamaker et al., 2007). While this study demonstrates a certain overlap of state and trait competitiveness, Study 3 will show that the state competitiveness scale is very different from trait competitiveness scales, in that it is sensitive to situational variations of competitiveness.

Table 4. Pearson's correlations, means, standard deviations, and Cronbach's alphas.

	mean	*sd*	1.	2.	3.	4.	5.	6.
1. Task SC	5.45	1.08	(.87)					
2. Ego SC	4.89	1.24	.24*	(.84)				
3. Task TC_{FB}	3.61	.84	.33**	–.13	(.86)			
4. Ego TC_{FB}	2.97	.94	.10	.42***	–.41***	(.86)		
5. Task TC_{NK}	3.73	1.04	.52***	.25*	–.16	.35**	(.90)	
6. Ego TC_{NK}	2.92	1.14	.19	.44***	–.46***	.76***	.57***	(.97)

Note: * significant at α = .05, ** sig. at α = .01, *** sig. at α = .001. Cronbach's alphas are provided in the diagonal.

While it is not the primary goal of this study, it is a convenient time to evaluate the relations between the ego and task subscales of the state and trait competitiveness instruments. As in Study 1, ego and task SC scales correlate positively, while the magnitude of the association is only low to moderate (r = .24). The situation differs for the links between

ego and task TC: the ego and task subscales of Newby and Klein's (2014) trait competitiveness scale correlate positively ($r = .57$), whereas the corresponding subscales of Franken and Brown's (1995) trait competitiveness scale correlate negatively ($r = –.41$). Further exploration of the correlations gives insight into the source of this opposing correlations. The confusion is not caused by ego TC—the ego TC scales correlate positively ($r = .76$, $p < .001$). Instead, the problem appears to originate in unrelated concepts of task TC ($r = –.16$, $p = .16$). In contrast to ego TC, task TC is not consistently reflected in psychometric scales. In fact, neither of the two trait competitiveness scales were developed with a theory of ego or task competitiveness in mind. Instead, the authors employed an inductive approach yielding four and five factors of competitiveness (Franken & Brown, 1995; Newby & Klein, 2014). Hence, it is not surprising that the scales do not completely agree. This does not invalidate the basic validity of the two-dimensional account of trait competitiveness—but it points to a possible inconsistency or impreciseness in the definitions of ego and particularly task TC.

5. Study 3: Confirmation of factor structure and first evidence of discriminant validity of the ego state competitiveness subscale.

The state competitiveness scale would be invalidated if it measured the same as an existing test that was designed to assess a different concept (Campbell & Fiske, 1959). In this study, thus, I want to demonstrate discriminant validity of the state competitiveness scale by showing that it measures something else than trait competitiveness scales. A key difference between traits and states is that states are situationally dependent, whereas traits remain stable over time. This means that variations in context should cause differences in state competitiveness, but not in trait competitiveness. Hence, the state competitiveness scale must reflect situational differences, while trait competitiveness measures should be insensitive to such variation.

One contextual factor that is likely to affect ego SC is the contest's prize spread. Prize spread refers to the difference between the winner and loser prizes (Connelly, Tihanyi, Crook, & Gangloff, 2014; Conrads, Irlenbusch, Rilke, Schielke, & Walkowitz, 2014; Harbring & Irlenbusch, 2011). For example, the prize spread is very large when the winner receives a prize and the loser receives nothing, whereas the prize spread is small when the winner prize is worth only a bit more than the loser prize. Thus, a larger prize spread makes winning and losing particularly salient. And as the focus on winning a contest is reflected in

the concept of ego SC, the ego SC level should increase with a larger prize spread. Trait competitiveness scores, in contrast, are independent of the situation and should thus not be affected by prize spread variations.

Hence, the present study aims at providing first evidence for discriminant validity of ego SC. Specifically, a manipulation of prize spread is hypothesized to affect ego SC but not ego TC. Note that in contrast to ego SC, task SC is unlikely to be affected by the prize spread manipulation. Task SC reflects the focus on personal development and task mastery—characteristics of the prize are thus not relevant for task SC. Accordingly, no effects are expected for task SC. A second goal of the present study is to confirm the state competitiveness scale's factor structure in a larger sample.

5.1. Materials and Methods

Subjects ($N = 206$) are recruited via the crowd working platform Amazon Mechanical Turk and participate in return for a compensation fee of $1.35. The average completion time is 7.4 minutes. The sample comprises 83 women and 123 men. Their age ranges from 20 – 72 years (*mean* = 38, *sd* = 11).

The study is implemented with the online tool SurveyMonkey and employs a 2 x 2 x 2 between-subjects design. The factors are scenario domain (sports/work), prize spread (small/large), and time of the ego TC assessment (before/after ego SC assessment). I will elaborate on each of these factors in the following paragraphs.

In this study, participants envision the scenario of a contest to subsequently report their corresponding state competitiveness (SC). More specifically, participants are asked to think of a contest that takes place between them and another person in the domain of either sports or work. The description also states that the other person has comparable chances of winning and that the contest is about to be completed. To increase identification with the scenario, details are left to the subjects' imagination. For example, subjects are invited to think of a sport or a company that is most relevant to them. The scenario descriptions are provided in Appendix E.

A large (small) prize spread in the sports contest is realized by making the winner prize $1000 ($550) and the loser prize $0 ($450). Note that the average prize is $500 in both cases. A large (small) prize spread in the workplace contest is realized by granting the winner a 25% (14%) salary raise and the loser no (11%) salary raise. Again, the average salary raise

is 12.5% in both cases. In both conditions it is explicitly pointed out that this is a large (small) difference.

The third factor reflects the order of trait and state competitiveness assessment. As traits are stable across situations, the prize spread manipulation and SC assessment should have no effect on trait competitiveness (TC). Likewise, an assessment of TC should not bias subsequently assessed SC. As this has not been tested before I experimentally control for order effects by assessing TC either before or after the scenario description and SC assessment.

After giving informed consent, participants are randomly assigned to one of the eight conditions (i.e., between 20 and 30 subjects per condition). Half of them start with completing the TC scales, that is, the desire-to-win and the improving-performance subscales of the Competitiveness/Mastery Questionnaire (Franken & Brown, 1995), which correspond to ego and task TC, respectively. The scales are preferred to alternative TC scales for their brevity (5 and 4 items, respectively). Afterwards (or as a first task, in case TC is assessed only after SC) subjects read the description of the contest scenario. To increase participants' involvement with the contest, they are asked to write a few sentences about their envisioned contest situation into a textbox. Afterwards, the participants complete the state competitiveness scale. Those who started with the scenario description and SC assessment are now asked to complete the TC items. It is stressed to participants that those items are no longer about the envisioned scenario but about general attitudes toward competition. After completing the experiment, all participants have the opportunity to read a short debriefing and to leave general comments in a textbox.

5.2. Results and Discussion

As in studies 1 and 2, the distribution of responses to the ego and task SC items is right-skewed. Shapiro-Wilk tests suggest that the answers deviate significantly from normality ($.93 < W < .97$, $3.61 < z < 5.41$, all $p < .001$). As before, the non-normality will be accounted for in the CFA by applying the Satorra–Bentler correction (Satorra & Bentler, 1994). The scales for ego/task TC and ego/task SC are reliable, with Cronbach's alpha coefficients between .81 and .90.

5.2.1. Discriminant validity

Ego SC is regressed on prize spread (small/large), with the scenario domain (sports/work) and the time of TC assessment (before/after SC assessment) included as covariates. An interaction between prize spread and scenario domain is included to test whether the expected effect of prize spread on ego SC differs between the sports and work domains. The results are summarized in Table 5 (left column). Indeed, a significant interaction between prize spread and scenario domain suggests that the effect of prize spread on ego SC depends on the domain of the envisioned scenario. Simple effects contrasts suggest that a larger prize spread causes increased ego SC in the sport domain ($c = 1.33$, $z = 4.56$, $p < .001$) but not in the work domain ($c = .44$, $z = 1.55$, $p = .108$).

In a second model, ego TC is regressed on prize spread, again including the covariates scenario domain and time of trait competitiveness assessment as well as the interaction between prize spread and the scenario domain. The results are summarized in Table 5 (right column). The model suggests that the manipulation of prize spread has no effect on ego TC.

Taken together, these results provide evidence for discriminant validity of the ego SC scale—the scale captures situational variations that the ego TC scale is not reflecting. Importantly, however, this was demonstrated only for contests in the sports domain.

As the effects of prize spread on performance have been widely studied in sports as well as work contexts (Connelly et al., 2014), there is no reason to believe that the effect of prize spread on ego SC exists only in sports contest. The result is better explained as a failure of the work contest scenario to reproduce a realistic situation that would activate ego SC. This explanation finds support in the short texts that participants wrote about their envisioned contest scenario: many of the participants in the large prize spread condition allude to the excessive amount of salary increase and are indignant at the unfairness of such a contest. Rejecting the contest for its unfairness or failing to seriously envision it for its unrealism are only two conceivable reasons for why the scenario did not lead to increased ego SC levels.

Nevertheless, the sports scenario condition establishes first evidence of discriminant validity of the ego SC scale. At the same time, the results add empirical support for the stability of ego TC (Harris & Houston, 2010).

Table 5. Results of ordinary least squares regressions.

	Dependent variable:	
	Ego SC	Ego TC
Prize spread	1.351*** (.292)	.062 (.197)
Scenario domain	–.624 (.290)	–.130 (.195)
Time of TC assessment	–.172 (.207)	.070 (.140)
Prize spread X scenario	.887* (.409)	.358 (.277)
Constant	4.416*** (.231)	2.705 (.157)
$F(4, 201)$	6.16***	.65
Adjusted R^2	.092	–.007

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

5.2.2. Confirmatory factor analysis

Wolf et al. (2013) suggest that conducting a CFA based on a two-factor model with five indicators per factor requires a minimum sample size of about 150—a criterion that the present study fulfills ($N = 206$). The ten items of the state competitiveness scales are submitted to a CFA as specified in Study 2. The Satorra–Bentler correction is applied to account for the data's non-normality (Satorra & Bentler, 1994). All items load between .61 and .88 on their factor (all ps $< .001$) and the covariance between the factors amounts to .28 ($p = .002$). Goodness-of-fit indices are displayed in Table 3. The χ^2-test for exact fit is significant, suggesting that the specified model does not fit the data as well as the saturated model. The RMSEA misses the critical value, too, suggesting no close fit. In contrast, the CFI and SRMR both indicate good fit (Hu & Bentler, 1999; Schreiber et al., 2006).

All in all, the indices indicate that the two-factor model fits the data much better than was the case in Study 2. As it appears, the results have improved due to the more appropriate sample size in this study (Wolf et al., 2013). And while the RMSEA of .74 misses Hu and Bentler's (1999) cutoff value of .06, it lies in an acceptable range according to Schreiber et al. (2006), who suggest that an acceptable fit is indicated by a RMSEA "< .06 to .08" (p. 330).

Taking everything into account, the two-factor model is likely to have good fit—overall supporting the factor structure of the state competitiveness scale.

As before, the model is compared to a one-dimensional solution. Table 3 contains the corresponding goodness-of-fit indices. All indices are beyond thresholds for good model fit. Moreover, a smaller AIC of the two-dimensional model indicates a better data fit of the two-dimensional model.

6. General Discussion

When we look at contests, behavior is often explained in terms of trait competitiveness (Brown, Cron, & Slocum, 1998; Krishnan, Netemeyer, & Boles, 2002; Lam, 2012). However, an individual's competitiveness in a given contest depends in part on situational factors, such as attributes of the contest or characteristics of the environment (Hartmann & Schreck, 2018). Such situational variation is reflected in the concept state competitiveness (Chapter 2). So far, empirical research on state competitiveness has been thwarted by the lack of an instrument for assessing and quantifying state competitiveness.

Against this background, I developed a short state competitiveness scale. In line with two-dimensional accounts of trait competitiveness (Hamaker et al., 2007; Houston et al., 2002), it comprises the subscales ego SC, which reflects a focus on demonstrating superiority, and task SC, which reflects a focus on improving one's skill level. The subscales consist of five items each, and they are positively, albeit weakly, correlated.

In the beginning, I argued that ego and task SC would be partly determined by ego and task TC, respectively (Hamaker et al., 2007). My study's results empirically support this assumption to the extent that the corresponding state and trait competitiveness scales correlate positively with each other. This also constitutes evidence in favor of the scales' convergent validity. At the same time, it is important to ascertain that state and trait competitiveness are clearly distinct in their consistence over time: while altering a contest's prize structure affects ego SC, the manipulation has no effect on ego TC. That is, ego SC varies with the situational conditions, while ego TC remains stable. This establishes evidence for the discriminant validity of the ego SC subscale. To corroborate this evidence, however, it is necessary to demonstrate that the effect of prize spread on ego SC is also present in a work setting. The present research failed to show this effect—possibly due to weaknesses in the design of the corresponding scenario description.

At this point discriminant validity of the task SC subscale remains to be established. For that purpose, task SC needs to be manipulated, which is not as straightforward as manipulating ego SC. This is corroborated by related research on achievement goals, reporting difficulties in manipulating a similar concept, namely task involvement (Ring & Kavussanu, 2018a, 2018b). A crucial element of task SC is the actor's genuine interest in improving her task performance and thereby foster personal development. Bönte et al. (2017) point out that personal development motives play only a minor role in experimental contests—the typical experimental task is simply not interesting enough to elicit task SC. If future research meets the challenge of devising a task that is both interesting and appropriate for lab or online research, this would enable testing the task SC subscale's discriminant validity.

As I laid out in this paper's introduction, ego SC might explain unethical behavior in contests, because unethical behavior is conducive to goal attainment when the primary goal is winning (Ring & Kavussanu, 2018a). This assertion is in line with the result of Study 3, which suggests an effect of prize spread on ego SC. Other research shows that prize spread also predicts increased effort as well as unethical behavior in contests (Harbring & Irlenbusch, 2011; Lazear & Rosen, 1981). The current study indicates that ego SC might serve as a mediator in the mutual effect of prize spread on effort and unethical behavior. That is, a large prize spread makes winning more salient and elicits ego SC, so that the actor accordingly focuses on winning the contest—by increasing effort and/or unethical behavior. With the state competitiveness scale, this hypothesis can now be tested empirically.

While I occasionally pointed to analogies between state competitiveness and achievement goals (Nicholls, 1989), a comprehensive comparison of the two concepts is beyond the scope of this paper. However, this could be an interesting avenue for future research—specifically, how do the two concepts relate to each other, to what extent is there overlap of the state competitiveness scale and instruments measuring ego and task involvement (Standage et al., 2005)?

To conclude, the state competitiveness scale constitutes a brief instrument for measuring task and ego SC. Its development sets the stage for the investigation of compelling research questions about behavior in contests. Moreover, the clear distinction between trait and state competitiveness enhances our general understanding of determinants of behavior in contests. Nonetheless, I acknowledge that the present study can only provide initial evidence of the scale's validity. Further research is needed to corroborate the validity of the scale, and the task SC subscale in particular.

7. Appendices

7.1. Appendix A: Overview of initial item pool and item deletions (Study 1)

Item		Focus	Source	Deletion	
				Time	**Justification**
1.	Performing well is more important than being best in this competition.	Task	Franken & Brown (1995)	0	ambiguity/definition
2.	Performing well is more important than being best in this task.	Task	Franken & Brown (1995)	1	cross-loading
3.	I will be happy if I exceed my previous performance even if I don't outperform the others now.	Task	Franken & Brown (1995)	1	cross-loading
4.	If I get good results now, it doesn't matter if the others do better.	Task	Franken & Brown (1995)	1	cross-loading
5.	I want to improve my competence in this task by competing now.	Task	Newby & Klein (2014)	0	redundant: similar item 30
6.	This task allows me to measure my own success.	Task	Newby & Klein (2014)	0	ambiguity/definition
7.	This challenge allows me to judge my competence.	Task	Newby & Klein (2014)	1	low loading
8.	I use this task as a way to prove something to myself.	Task	Newby & Klein (2014)	0	ambiguity/definition
9.	Being best at this challenge would mean that I did a good job.	Task	Own	0	ambiguity/definition
10.	I am genuinely curious about just how good I am in this task.	Task	Own	0	ambiguity/definition
11.	This challenge inspires me to excel myself and my previous performance.	Task	Own	0	redundant: similar item 30
12.	My goal today is to get better than I was before.	Task	Own		
13.	I feel good when I improve my own performance at this task.	Task	Own	0	ambiguity/definition
14.	Mastering this challenge is more important than beating the others.	Task	Own	0	redundant: similar item 1

15.	Being best at this would assure me that I really mastered the task.	Task	Own	1	cross-loading
16.	Right now, my personal best is the most important thing.	Task	Own	2	redundant: similar item 12
17.	I see this contest as a possibility to prove something to myself.	Task	Own		
18.	The presence of the others is motivating me to surpass my personal best now.	Task	Own	1	cross-loading
19.	Right now, I really want to beat the standard I've set to myself.	Task	Own	2	redundant: similar item 12
20.	This challenge is giving me a chance to discover my abilities.	Task	Ryckman et al. (1996)	2	redundant: similar item 22
21.	I find this task enjoyable, because it lets me express my own potentials and abilities.	Task	Ryckman et al. (1996)	0	difficult/complex
22.	This activity helps me to develop my abilities.	Task	Ryckman et al. (1996)		
23.	Without this challenge I might never discover that I had certain potentials or abilities.	Task	Ryckman et al. (1996)	0	difficult/complex
24.	I enjoy this task because it brings me and the others closer together as human beings.	Task	Ryckman et al. (1996)	0	ambiguity/definition
25.	The others help me to develop my own potentials more fully than if I engaged in this activity alone.	Task	Ryckman et al. (1996)	2	redundant: similar item 22
26.	I value the other contestants for motivating me to bring the best out of myself.	Task	Ryckman et al. (1996)		
27.	Through this task I feel that I am contributing to the others' well-being.	Task	Ryckman et al. (1996)	0	ambiguity/definition
28.	The current task is increasing my awareness and understanding of myself and others.	Task	Ryckman et al. (1996)	0	ambiguity/definition
29.	Doing this task could lead to the formation of friendship with others.	Task	Ryckman et al. (1996)	0	ambiguity/definition
30.	This challenge motivates me to bring out the best in me and to excel myself.	Task	Ryckman et al. (1996)	2	difficult/complex

31.	This task brings out the best out of me.	Task	Ryckman et al. (1996)	0	redundant: similar item 30
32.	I enjoy this task more because it is bringing out the best of me than because it gives me the chance to beat others.	Task	Ryckman et al. (1996)	0	difficult/complex
33.	I find this competition a valuable means of learning about myself and others.	Task	Ryckman et al. (1996)		
34.	This competition could teach me something about myself.	Task	Ryckman et al. (1996)	2	redundant: similar item 17
35.	I value this task because it helps me to be the best that I can be.	Task	Ryckman et al. (1996)	0	redundant: similar item 30
36.	For this challenge to be a success, I must perform better than everyone else.	Ego	Franken & Brown (1995)	1	low loading
37.	It is important to me to do better than the others on this task.	Ego	Franken & Brown (1995)	0	redundant: similar item 42
38.	I feel that winning is important in this moment.	Ego	Franken & Brown (1995)	0	redundant: similar item 58
39.	A success would be to do better than the others rather than just getting a good result.	Ego	Franken & Brown (1995)		
40.	It annoys me when one of the others perform better than I do.	Ego	Franken & Brown (1995)	0	avoidance/loss frame
41.	I am very competitive at the moment.	Ego	Newby & Klein (2014)	0	ambiguity/definition
42.	It is important for me to outperform the others now.	Ego	Newby & Klein (2014)	0	redundant: similar item 58
43.	I like to be better than the others at this task.	Ego	Newby & Klein (2014)	0	redundant: similar item 45
44.	I try to be the best person at this moment.	Ego	Newby & Klein (2014)	0	redundant: similar item 45
45.	No matter what, right now I try to be better than others.	Ego	Newby & Klein (2014)	0	redundant: similar item 50
46.	I think about competing right now.	Ego	Newby & Klein (2014)	0	ambiguity/definition
47.	I think about how I can win at this task.	Ego	Newby & Klein (2014)	1	wrong cluster
48.	This situation gives me a chance to prove that I am better than the others.	Ego	Newby & Klein (2014)	2	redundant: similar item 39
49.	I notice that I am really competitive right now.	Ego	Newby & Klein (2014)	0	ambiguity/definition
50.	I feel an urge to outperform the others.	Ego	Newby & Klein (2014)	1	cross-loading
51.	I enjoy beating the others in this.	Ego	Newby & Klein (2014)		

52.	Other people might notice how much I have to dominate others in this moment.	Ego	Newby & Klein (2014)	0	redundant: similar item 51
53.	I will put a lot of effort into beating the others at this.	Ego	Newby & Klein (2014)	1	wrong cluster
54.	I want to see the others lose.	Ego	Own	0	redundant: similar item 59
55.	I want to outperform the others because I like being first.	Ego	Own	0	ambiguity/definition
56.	I am competing now because I want to show that I can do this better than the others.	Ego	Own	0	redundant: similar item 42
57.	I want to outperform everyone else in this moment.	Ego	Own	0	redundant: similar item 50
58.	Right now, winning is the most important thing to me.	Ego	Own		
59.	I want the others to lose now.	Ego	Own		
60.	Performing best in this task makes me feel more powerful as a person.	Ego	Ryckman et al. (1990)	2	redundant: similar item 81
61.	I do not like giving credit to one of the others for doing something that I could have done just as well or better.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
62.	If I could disturb the others in some way in order to get the edge on them, I would do so.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
63.	I would really feel down if I lost against the others.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
64.	I want to win at this to gain praise from others.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
65.	I want to win this competition to gain recognition from others.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
66.	It would bother me to be surpassed by another contestant in this competition.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
67.	I couldn’t stand losing at this.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
68.	I feel superior when I do better at this than the others.	Ego	Ryckman et al. (1990)	0	redundant: similar item 81
69.	I feel the need to get even with someone who previously beat me at this task.	Ego	Ryckman et al. (1990)	0	ambiguity/definition

70.	If someone beat me now, I would feel the need to get even with that person.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
71.	I find myself being competitive even if this situation does not call for competition.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
72.	Performing worse than the others in this situation would affect me.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
73.	Losing at this would make me feel less worthy as a person.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
74.	People who quit this task are being weak.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
75.	This challenge inspires me to excel.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
76.	This challenge makes me want to win.	Ego	Ryckman et al. (1990)	1	wrong cluster
77.	You cannot be a nice person and still be successful in this moment.	Ego	Ryckman et al. (1990)	1	low loading
78.	I find it difficult to be fully satisfied with my performance in this situation.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
79.	I see my opponents in this situation as enemies.	Ego	Ryckman et al. (1990)	2	low loading
80.	I compete with the others today, even if they are not competing with me.	Ego	Ryckman et al. (1990)	0	ambiguity/definition
81.	Success in this task would make me feel superior to the others.	Ego	Ryckman et al. (1990)		
82.	Performing best at this task would give me a greater sense of worth.	Ego	Ryckman et al. (1990)	2	redundant: similar item 81
83.	If someone else wins today's competition, I feel envy.	Ego	Ryckman et al. (1990)	0	avoidance/loss frame
84.	I find myself turning this friendly activity into a serious contest.	Ego	Ryckman et al. (1990)	2	ambiguity/definition
85.	It's a dog-eat-dog world. If I don't get the better of the others now, they will surely get the better of me.	Ego	Ryckman et al. (1990)	0	difficult/complex

Note. Deletion time 0 = prior to data collection; 33 items remaining. Deletion time 1 = first phase of item reduction in exploratory factor analysis (EFA); 21 items remaining. Deletion time 2 = second phase of item reduction in EFA; 10 items remaining.

7.2. Appendix B: Scenarios (Study 1)

7.2.1. Sales contest

Imagine you are working at a store for sporting goods. Your employer regularly holds sales contests to see who can sell most on one day. The winner of the contest receives a prize. Imagine that you participate in such a sales contest today. As in previous occasions, you compete against nine others who are working at the store with you. You are doing quite well on this: Together with two colleagues, you took the lead in today's sales contest. The store is open for two more hours and the three of you are going head to head. You are giving your best to sell more goods than the others.

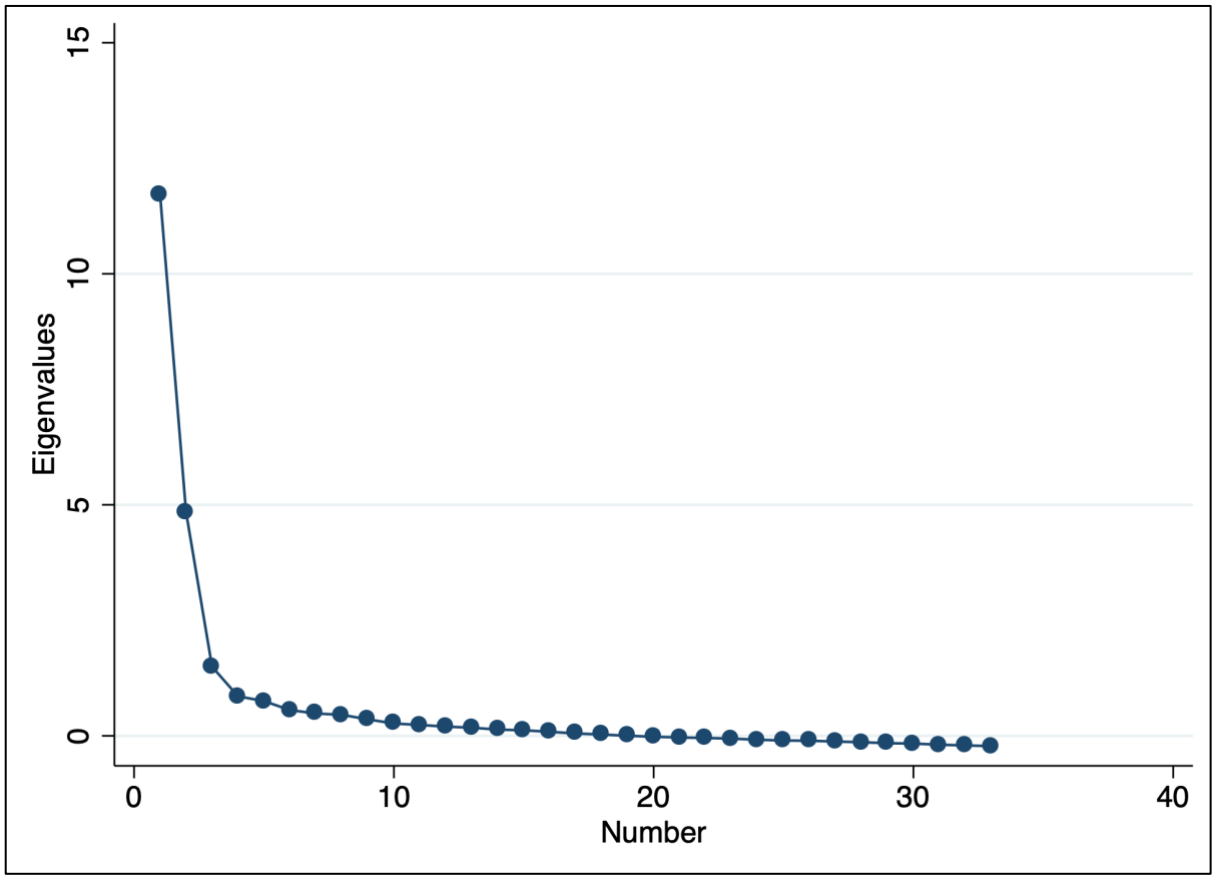
7.2.2. Mini Olympics

Imagine you are working at a software company. Every year, your employer is holding a sports competition for team building and to promote a healthy lifestyle. The winner in each discipline receives a prize. Imagine that you participate in these "mini Olympics" today. As in previous years, you run the 800m middle distance. You compete against nine others in this discipline. You are doing quite well on this: Together with two colleagues, you took the lead in the race. There are 200 meters left and the three of you are going head to head. You are giving your best to run faster than the others.

7.2.3. Scrabble contest

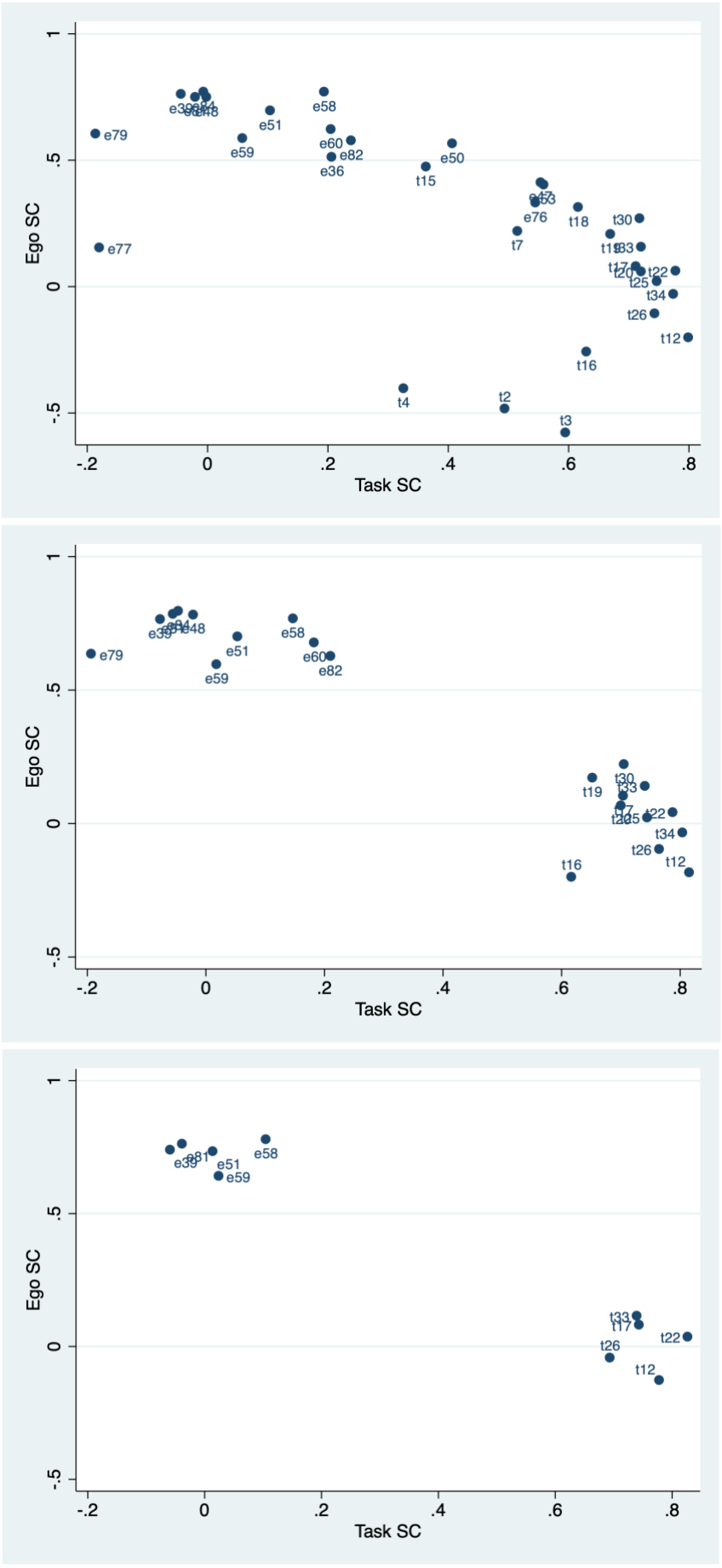
Imagine you are working at an advertising agency and you regularly play the word game Scrabble with your colleagues. Playing Scrabble has been suggested to increase creativity, so your employer organizes a Scrabble contest for your team. You compete against nine others. The winner receives a prize. You are doing quite well on this: Together with two colleagues, you took the lead in the Scrabble contest (the three of you collected considerably more points than the rest). Imagine that you have a Scrabble match today with the other two front runners. You are in the middle of the game and the three of you are going head to head. You are giving your best to make more points than the others.

7.3. Appendix C: Scree plot (Study 1)



Note: According to the scree test, factors left of the kink are retained—in this case that is two factors (Cattell, 1966).

7.4. Appendix D: Loading plots (Study 1)



Note. Top plot depicts factor loadings of initial set of 33 items. Middle plot depicts factor loadings after first phase deletions, i.e. 21 items. Bottom plot depicts factor loadings after second phase deletions, i.e., 10 items (final scale). Ego SC items start with the letter " e " and task SC items start with the letter " t " . This note and the headline are arranged vertically to allow larger displays of the plots.

7.5. Appendix E: Scenario descriptions (Study 3)

7.5.1. Work contest

In the text below, you will be asked to think of a situation in which you are competing with a colleague from work. It is not necessary that you have actually experienced such a contest in the past. Just try to envision yourself in the described situation as vividly as possible. If you are working for a company with more than about 10 employees, think of that job. If you are not working for such a company, think of a large company that you can imagine working for.

Imagine that you are a highly valued employee; always working hard and doing a good job. The company that you work for is doing well, too. Therefore, to reward and further motivate the employees, the company management is organizing competitions. Together with another employee, you were selected for such a competition. Like you, this employee does excellent work. Over the course of a week, both of you will be evaluated to determine the contest's winner. The winner will be granted a 25% (14%) raise in salary. The loser, on the other hand, will get no (11%) salary raise. Note that the difference between the winner and loser prize is very large (small).

Now, imagine how you get ready for the contest, that is, the upcoming evaluation period. Take a moment to consider what it would be like to win and receive the winner prize of 25% (14%) salary raise. And what would it be like to lose and receive the loser prize of no (11%) salary raise? How do you feel about the large (small) difference between the winner and loser prize?

7.5.2. Sports contest

In the text below, you will be asked to think of a situation in which you are competing with another person in a sports contest. It is not necessary that you have actually experienced such a situation in the past. Just try to envision yourself in the described situation as vividly as possible. Please pick your preferred individual sport. It must be an individual sport, where competition with another person is possible (that is, no team sport). If you practice such a sport, think of that one. If you don't practice such a sport, just pick the individual sport that you can most relate to—maybe running or boxing?

Imagine that a competition with another person is about to take place. You and the other person are on the same level – it will be a close call. There is a sponsor who provides prize money for this contest: The winner will receive $1000 (550) and the loser will receive $0 (450). Note that the difference between the winner and loser prize is very large (small).

Now, imagine how you get ready for the contest. Take a moment to consider what it would be like to win and receive the winner prize of $1000 (550). And what would it be like to lose and receive the loser prize of $0 (450)? How do you feel about the large (small) difference between the winner and loser prize?

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CHAPTER 4

Framing a Contest in Terms of Ego Competition Increases Cheating

Abstract

Contests are widely used in organizations to motivate employees and promote performance. However, an undesired side effect of contests is that employee cheat more. I argue that individuals cheat when their primary motivation during a contest is winning and demonstrating superiority. To test this, I conduct an online experiment. Participants are set up in dyads to compete in a problem-solving task. Prior to the contest, they read a text which emphasizes either the opportunity to beat the opponent and demonstrate superiority (ego framing) or the opportunity to develop one's skills and enjoy the task (task framing). During the following contest participants have the opportunity to cheat by overstating their performance. Results suggest that ego framing increases ego state competitiveness, a concept entailing a person's momentary focus on winning a contest. Ego state competitiveness in turn predicts cheating. At the same time, contest framing does not affect performance in the problem-solving task. Taken together, the results imply that contest organizers may frame their contests in terms of task competition to reduce ego state competitiveness and cheating without compromising employee performance.

1. Unethical behavior in contests

When 15,540 Americans were asked about the source of their most recent real wage increase, over 41.6% of them responded that they received their last pay raise due to a better performance than their peers (Cowgill, 2015). This illustrates the ubiquity of competition among employees in today's organizations. Competition is defined in terms of negative goal interdependence (Deutsch, 1949). Negative goal interdependence exists when two or more employees have a common goal, while attainment of the goal by one employee implies that the other employee(s) cannot attain the goal. Organizations utilize competition to motivate employees, stimulate more effort and yield higher performance (DeVaro, 2006). This practice is backed by experimental research suggesting that competition indeed stimulates effort and performance (Kosfeld & Neckermann, 2011)—even though this effect is not undebated (Murayama & Elliot, 2012). While the term competition denotes the basic structure of negative goal interdependence, I use the term contest to refer to specific and deliberate instances characterized by competition (see Chapter 2). Typical examples for contests in organizations are sales contests (Moncrief, Hart, & Robertson, 1988; Poujol, Harfouche, & Pezet, 2016) or promotion tournaments (Chan, 1996; Connelly, Tihanyi, Crook, & Gangloff, 2014).

Contests among employees come with certain drawbacks. More specifically, there is a widely documented association of competition and unethical behavior (Cartwright & Menezes, 2014; Charness, Masclet, & Villeval, 2014; Rigdon & D'Esterre, 2015; Schreck, 2015; Schwieren & Weichselbaumer, 2010). The literature documents two categories of unethical behavior in contests, sabotage and cheating (Preston & Szymanski, 2003; Rigdon & D'Esterre, 2015, 2017). While sabotage refers to activities aimed at decreasing another employee's performance score (Chowdhury & Gürtler, 2015; Gläser, van Gils, & Van Quaquebeke, 2017; Harbring & Irlenbusch, 2011), cheating refers to any behavior that aims at illegitimately inflating one's own performance score (Cartwright & Menezes, 2014; Gilpatric, 2011). Both sabotage and cheating occur in contests, and both behaviors can increase chances of winning the contest (Harbring & Irlenbusch, 2011; Schwieren & Weichselbaumer, 2010). In the present paper, I focus on cheating.

To illustrate how cheating may be utilized to increase one's rank in contests, suppose an organization in which employees are ranked on basis of the number of closed business deals. Salespeople in this scenario might add shaky deals to their score, even though they

know that the deal will be cancelled in the future (Hampton, 1970). Alternatively, employees might add deals to their score that should really be accounted for in the following period (Moncrief et al., 1988). In a different context, an auditor may overstate her work quantity to increase the chances of gaining partner status (Grover, 1993).

By cheating, employees grant themselves an undeserved advantage, thus harming preempted colleagues. Accordingly, cheating transgresses the fairness norm and therefore constitutes immoral behavior (Clarke & Aram, 1997). In addition, cheating employees can have serious economic effects on the organization. Recall the example of the employees who close deals of which they know that they will be cancelled (Hampton, 1970). Such kind of deals incur extra costs to the company. Moreover, customer orientation deteriorates during sales contests (Poujol & Tanner, 2010). Depending on the severity of the transgression, legal consequences and associated effects on company image are easily conceivable, as well (Shi, Connelly, & Sanders, 2016). In contrast, it should be noted that in some cases, the organization may benefit from cheating employees as long as it remains undetected (Gilpatric, 2011; Stowe & Gilpatric, 2010).

To sum up, organizations utilize contests among employees to stimulate effort. However, a side effect of contests is that employees cheat to increase their chances of winning. As cheating is not only immoral but usually also detrimental in an economic sense, it is—for the most part—in the interest of organizations to reduce cheating in contests.

The literature suggests various ways of reducing cheating in contests. One possibility is to increase the likelihood of cheating being detected (Stowe & Gilpatric, 2010) and being sanctioned (Balliet, Mulder, & Van Lange, 2011; Treviño, 1992). Such generic measures may treat the symptoms, i.e., reduce unethical behavior, however, the underlying reason for cheating is not addressed. In an attempt to overcome this weakness, I argue that the contest must be designed in a way that minimizes incentives to cheat. One characteristic of contests that is known to reduce unethical behavior is a small prize spread (Conrads, Irlenbusch, Rilke, Schielke, & Walkowitz, 2014). A contest's prize spread is small when the difference between winner and loser prize is small. In a promotion tournament, this can be the change in salary awarded to the winner (Connelly et al., 2014). However, a small prize spread is at the same time associated with lower productive effort (Kräkel, 2007). It is debatable whether contest organizers are willing to sacrifice employee effort for fairness. This makes lowering the prize spread an unfeasible mechanism for the reduction of cheating in contests.

Taken together, there is a lack of feasible approaches to reduce cheating in contests—a gap that I aim to address with this study. Specifically, I want to identify a contest attribute

that may be utilized to reduce cheating without compromising effort. In the following section I will develop an attribute that might fulfill these criteria.

2. Theory and hypotheses

In order to find an appropriate determinant of cheating in contests, let me take a step back and discuss what it is about contests that seems to motivate people to expend extra effort. The opportunity to win a material prize is surely an important aspect—indeed, a larger prize is associated with higher effort (Harbring & Irlenbusch, 2011). However, people exert themselves in contests even in the absence of tangible rewards (Charness et al., 2014; Hannan, McPhee, Newman, & Tafkov, 2012). Hence, winning prizes cannot fully explain the motivating effect of contests.

Festinger's social comparison theory (1954) offers an additional explanation as to why contestants work hard even without the chance for a prize. The theory posits that people compare themselves with others for self-evaluation, and that they have a natural drive to improve (Festinger, 1954; Garcia, Tor, & Schiff, 2013). As a result, people are particularly motivated to perform well when competing against others. This is illustrated by neuro-physiological research suggesting that a favorable social comparison (i.e., winning) stimulates the human reward system (Fliessbach et al., 2007). Winning thus results in a positive emotional response—a feeling that some researchers call the "joy of winning" (e.g., Dohmen, Falk, Fliessbach, Sunde, & Weber, 2011, p. 280).

As mentioned earlier, there are several ways in which a contest can be won—and the joy of winning be experienced. The legitimate way is to expend productive effort. Opposed to that, an illegitimate way is to cheat. Hence, cheating can be understood as a strategy adopted to increase one's chances of winning. Of course, cheating is particularly useful when one's ability is not sufficient to win the contest in an honest manner (Schwieren & Weichselbaumer, 2010).

While winning is a desired feeling (Dohmen et al., 2011; Fliessbach et al., 2007), it is not equally important in any situation. That is, at times winning may seem really important, while at other times, we may not be bothered with winning at all. This situational variability is reflected by a concept called *ego state competitiveness* (ego SC; Chapter 2; Chapter 3). Let me outline this concept with an admittedly long name. In short, ego SC is a contestant's desire to win for its own sake (i.e., the sake of winning; Malhotra, 2010). When someone experiences high levels of ego SC, his primary goal is winning the contest, beating his

opponent, and demonstrating his superiority (Chapter 3; Houston, McIntire, Kinnie, & Terry, 2002; Nicholls, 1989; Tassi & Schneider, 1997). Ego SC stands in contrast to task state competitiveness (task SC, Chapter 2, Chapter 3). Albeit not being the focus of the present study, task SC helps understanding the crucial aspects of ego SC: in contrast to ego SC, task SC refers to the desire of contestants to master the task at hand, to develop personally during the contest, and to enjoy the activity itself. Winning is thus secondary for someone who experiences primarily task SC (Chapter 3; Houston et al., 2002; Ryckman, Hammer, Kaczor, & Gold, 1996).

To sum up, ego SC is a momentary focus on winning a specific contest for its own sake. The crucial point here is that, to the extent that winning is a contestant's primary goal, cheating constitutes a reasonable strategy to achieve this goal. A person currently experiencing increased levels of ego SC is highly focused on winning and demonstrating her superiority—possibly so much that any means that help achieving that goal appear to be appropriate to that person. Pursuing the goal of winning may overtop everything else, including moral concerns, thereby increasing the occurrence of cheating (Mudrack, Bloodgood, & Turnley, 2012). Note that this would not be the case if the individual would experience primarily task SC and be accordingly concerned with improving her skills in the contest. In that case, cheating would be irrelevant because cheating would not help her improving her skills (Kavussanu & Ntoumanis, 2003). Ego SC, on the other hand, is arguably a positive predictor of cheating in contests.

Some empirical research bolsters the claim that ego SC might cause cheating. For example, Kilduff, Galinsky, Gallo, and Reade (2016) show that competing with rivals causes a preoccupation with winning, i.e., ego SC, which in turn increases unethical behavior. Other research finds that conceiving a negotiation in terms of winning rather than cooperation increases deception (Schweitzer, DeChurch, & Gibson, 2005). Much evidence comes from research on achievement motivation (Ames & Archer, 1987; Nicholls, 1989). This literature has spawned the concept *ego involvement*, which has considerable overlap with the here studied concept ego SC. Ego involvement refers to the momentary desire to be better than someone else (Nicholls, 1989; Ring & Kavussanu, 2018a, 2018b). In contrast to ego SC, however, ego involvement denotes a broader concept which does not necessarily involve competition. Ego involvement may occur even when there is no competition, that is, a second person with the same goal as the first person (Deutsch, 1949). Research on ego involvement highlights a consistent link to unethical behavior (Ring & Kavussanu, 2018a, 2018b; Van Yperen, Hamstra, & van der Klauw, 2011).

The previous paragraph revealed research linking ego involvement and related concepts to unethical behavior, particularly cheating. It should be noted that some authors even presume that cheating or unethical behavior is inherent in ego competitiveness. For example, cheating is part of Tassi and Schneider's (1997) questionnaire to assess ego competitiveness ("Cheats in order to have teacher mark his (her) work correct," p. 1564). Similarly, Ryckman, Hammer, Kaczor, and Gold (1990) develop a measure of hypercompetitiveness, which is related to ego SC. Their questionnaire contains an item reflecting unethical behavior ("If I can disturb my opponent in some way in order to get the edge in competition, I will do so", p. 633). In contrast to these earlier accounts of ego competitiveness, ego SC as it is understood in the present work does not necessarily encompass cheating. Rather, ego SC and cheating are correlated, yet distinct concepts.

As pointed out in the previous paragraphs, there are good arguments and empirical evidence suggesting that ego SC might determine unethical behavior in contests. At this point, it is important to recall that ego SC is as a situationally dependent concept.[10] This means that different situations affect ego SC differently. Some contests may drive up ego SC, while other contests may rather diminish it. Therefore, the ego SC level may be changed by altering the situation. More specifically, specific attributes of a contest might cause the ego SC level to increase or decrease.

Which attribute of a contest is capable of altering contestants' ego SC level? Since the seminal work by Tversky and Kahneman (1981) we know that even subtle variations of phrasing can cause significant changes in behavior. I therefore suggest framing the contest in a way that increases/decreases ego SC. Previous experimental research on achievement goals has utilized framing to manipulate participants' ego involvement (Standage, Duda, & Pensgaard, 2005). Specifically, the respective task is described to participants emphasizing the importance of winning and beating the opponent. As opposed to that, an alternative treatment includes a task description emphasizing that, rather than winning, improving the personal performance is the primary goal. Manipulation checks confirm that the authors successfully imposed ego vs. task involvement on their participants. Other studies take a similar approach in manipulating ego involvement (Ring & Kavussanu, 2018a, 2018b; Sage & Kavussanu, 2007).

[10] Ego SC is contrasted by more traditional accounts of ego *trait* competitiveness (Franken & Brown, 1995; Houston et al., 2002). For a discussion of the relation between states and traits, the reader is referred to Hamaker, Nesselroade, and Molenaar (2007).

Following the manipulations utilized in previous research on ego involvement, I suggest framing a contest either in terms of ego competition or in terms of task competition. Ego framing involves stressing the opportunity for winning and demonstrating one's superiority, whereas task framing involves stressing the opportunity for enjoyment and personal development. By stressing ego competition, participants are expected to adopt the respective goals and accordingly display increased ego SC levels. And as argued previously, ego SC is expected to cause cheating, because cheating helps attaining the primary goal of winning. Taken together, I hypothesize that ego-framing causes cheating and that this effect is mediated by ego state competitiveness:

Hypothesis 1: Ego-framing causes cheating.
Hypothesis 2: Ego SC mediates the effect of ego-framing on cheating.

Empirical support for the hypotheses would suggest that cheating can be reduced by framing a contest in terms of task competition rather than ego competition. To be practically relevant, however, the framing intervention must not reduce employee performance (Larkin & Pierce, 2015). A meta-analysis on the link between situationally induced achievement goals and performance suggests that the opposite might be the case (Van Yperen, Blaga, & Postmes, 2015). Specifically, the study shows that, overall, ego involvement leads to lower performance (compared to task involvement). These results are in line with a different meta-analysis on incidental (i.e., not experimentally induced) achievement goals (Van Yperen, Blaga, & Postmes, 2014). Following these results, I hypothesize that ego-framing causes poorer performance:

Hypothesis 3: Ego-framing decreases task performance.

3. Methods

3.1. Task

The study is implemented in LIONESS Lab, a web-based platform for interactive online experiments (Giamattei, Molleman, Seyed Yahosseini, & Gächter, 2019). Subjects are asked to complete two periods of a problem-solving task widely known as the matrix task (Mazar, Amir, & Ariely, 2008; Verschuere et al., 2018). In each period, there are ten matrices on one

webpage and subjects may work on the matrices in any order they desire. Each matrix contains 4 x 3 numbers between zero and ten with two decimals. The task is to identify in each matrix those two numbers that add up to ten (see Figure 1). All matrices are solvable (cf. Mazar et al., 2008; Verschuere et al., 2018). In each period, subjects are given two minutes to solve as many matrices as possible. After the two minutes, the correct solutions are displayed, and subjects have to count the number of matrices that they solved correctly. The result has to be typed into a text field and constitutes this study's main dependent variable "reported performance."

To implement a contest situation, subjects are arranged in dyads. The players of a dyad compete with each other in the matrix task for both periods. The contestant who reports a higher number of solved matrices wins. One of the two periods is randomly selected for payout—the winner receives £ 1.50 and the loser receives £ 0.50. In case of a tie, both participants receive £ 1.00. The prize is added to the basic participation fee of £ 1.50.

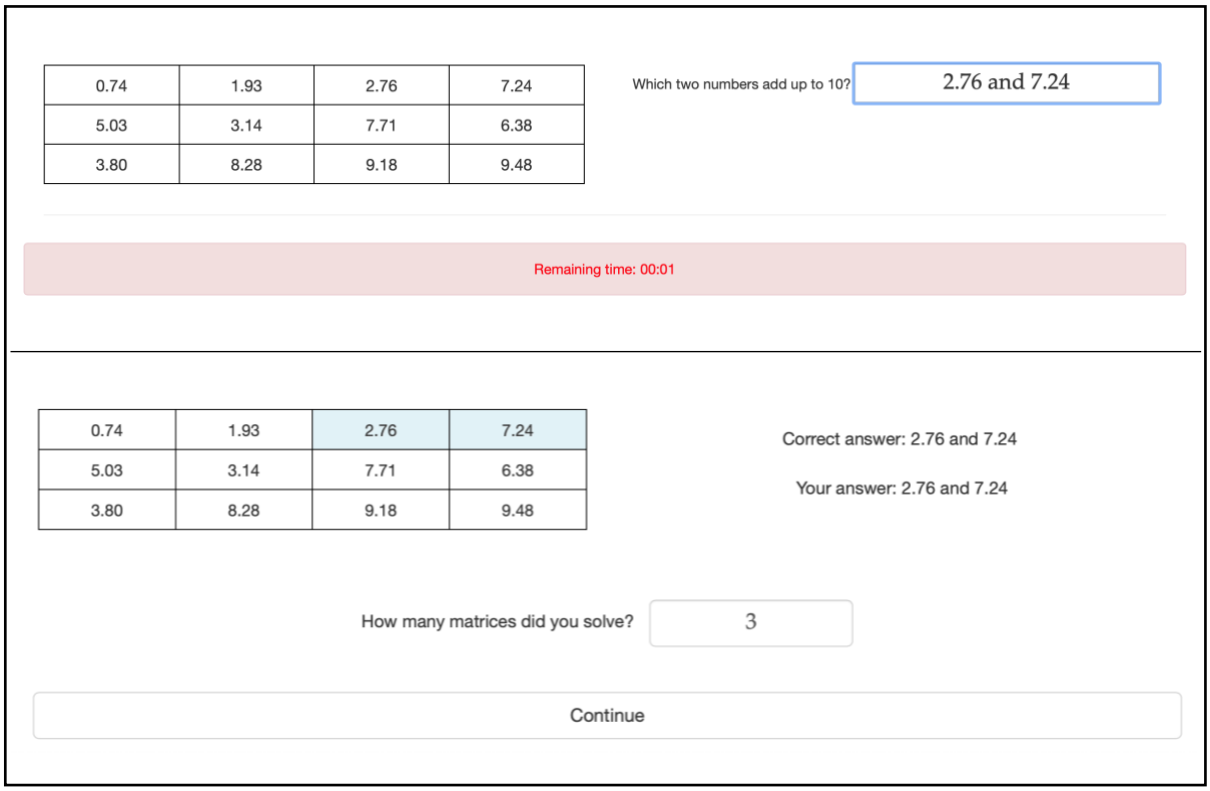

Figure 1. The top panel depicts an example matrix in the detectable cheating condition—the response is typed into the text field next to the matrix. The bottom panel depicts the corresponding solution that would be displayed to the subject after the passing of two minutes. Next to the correct solution the screen also provides the response that was given by the subject. As the figure depicts the last of 10 matrices, i.e., the bottom of the webpage, one can also see the text field in which the subject would report the performance ("How many matrices did you solve?").

3.2. Design

The study employs a 2 x 2 factorial design. One factor is cheating detectability, with the levels “detectable” and “undetectable”. The other factor is contest framing, with the levels “task” and “ego”. The factors are elucidated in the following two sections.

3.2.1. Cheating detectability

In the *undetectable cheating* condition subjects are asked to note their answers on a piece of paper. After the two minutes have passed, the correct solutions are displayed to the subject. The subject is asked to check her answers, count the number of correctly solved matrices, and enter the result into a text field. In this condition it is impossible for any experimenter to verify whether the subject reported her performance truthfully. Therefore, it is relatively likely that some subjects will overstate their performance.

In contrast, the *detectable cheating* condition requires subjects to type their answers into a text field right next to each matrix (see Figure 1, top panel). After the two minutes have passed, the correct solutions are displayed together with the answers given by the subject (see Figure 1, bottom panel). The subject is asked to check his answers, count the number of correctly solved matrices, and enter the result into a text field (see Figure 1, bottom panel). Technically, it is possible to overstate the performance here, as well. However, as the subjects’ answers are displayed back to them, they are fully aware that their answers have been recorded. It is thus obvious to subjects that overstating one’s performance is easily detected by the experimenter. Accordingly, it is relatively unlikely that subjects will overstate their performance in this condition.

Note that the factor cheating detectability makes this study’s design different from the one used in the seminal paper by Mazar et al. (2008). These authors include the factor “ability to cheat” (yes/no). It implies that the answers of one group are checked by the experimenter, yielding the true performance score. The other group self-checks their answers. The increased performance in this group may be attributed to intentional cheating, but it might as well be attributed to unintended reporting mistakes, such as errors of checking or miscounting one’s correctly solved matrices (Gerlach, Teodorescu, & Hertwig, 2019). To tackle this weakness, the present study allows all participants to commit unintended reporting mistakes. This way, any differences in reported performance between the levels detectable cheating and undetectable cheating can be unequivocally attributed to deliberate misreporting

of performance. Nevertheless, in principle, this study's design is congruent with Mazar et al.'s (2008) design.

Critical readers may argue that typing vs. handwriting the answers to the matrices confounds cheating detectability with an effect of writing method. However, it is unlikely that writing method will have an effect on performance in the present study. Noting the answers constitutes a neglectable part of the matrix task. Most of the two minutes is spent looking for the solution—on average, subjects report solving only 3.76 matrices in that time. Hence, any differences in reported performance between detectable and undetectable cheating can be attributed to cheating and not to real performance differences.

3.2.2. Contest framing

The contest description is framed in terms of either ego or task competition. To that end, I create a pool of attributes that previous research has ascribed to ego and task competitiveness, respectively (Horney, 1936; Houston et al., 2002; Ryckman et al., 1990, 1996; Ryckman, Libby, van den Borne, Gold, & Lindner, 1997; Tassi & Schneider, 1997). For an overview of these attributes, the reader is referred to Table 1 in Chapter 3. Based on these attributes I write two equally structured contest descriptions that emphasize either ego or task competition (Ring & Kavussanu, 2018a, 2018b; Standage et al., 2005).

In the ego framing condition, the contest is described mainly as a way to demonstrate superiority and winning is particularly emphasized. For example, subjects in this condition read "For the contest you will be **matched with an opponent** (…). Certainly, the primary goal in this competition is to **win**—and there is also a prize to win."

In contrast, the task framing condition provides a contest description that stresses personal development and task enjoyment. For example, subjects in the task framing condition read "For the contest you will be **matched with a partner** (…). Certainly, the primary goal in this competition is to **have fun**—but there is also a prize to win" (see Appendix for a longer excerpt of the experimental instructions).

The manipulation is further reinforced by displaying a photograph depicting two arm wrestling persons next to the contest description. The task framing condition includes a version in which the arm wrestlers are joyfully laughing. The ego framing condition includes a version in which the same actors look more contemptuously.

To ensure that subjects attend to the details in the contest descriptions, they have to correctly answer three items checking their understanding of the contest descriptions. Moreover, right before each period of the matrix task, subjects are reminded once more of

trying to beat their opponent (i.e., ego framing) or enjoying the challenge and learn something (i.e., task framing).

3.3. Instruments

Prior to the first matrix task, subjects complete a scale that assesses state competitiveness (see Chapter 3). The scale comprises five items assessing ego SC (e.g., "I want the other one to lose now") and five items assessing task SC (e.g., "My goal today is to get better than I was before"). Items are rated on 7-point Likert scales ranging from 1 = completely disagree to 7 = completely agree.

After completion of the matrix task subjects' trait competitiveness is assessed. Task and ego trait competitiveness (task and ego TC) are measured with the *improving performance* and *desire to win* subscales of the Competitiveness/Mastery Questionnaire, respectively (Franken & Brown, 1995). Items are rated on 7-point Likert scales ranging from 1 = completely disagree to 7 = completely agree.

An attention check item is included along with the SC and the TC items, respectively ("Please choose completely disagree for this attention check item;" Oppenheimer, Meyvis, & Davidenko, 2009).

3.4. Participants and procedure

Participants were recruited from Prolific, a web-based service specialized in bringing together researchers and potential research subjects (Prolific Academic Ltd, 2019). Prolific has been argued to offer a large, diverse, and conscientious subject pool suitable for psychology and economics research (Palan & Schitter, 2018; Peer, Brandimarte, Samat, & Acquisti, 2017). Data collection took place in seven sessions between July 26 and August 9, 2019. All sessions took place during weekday afternoons, because people who participate during those times tend to be more experienced with online studies (Arechar, Kraft-Todd, & Rand, 2017).

One hundred and seventy-two subjects from the United Kingdom signed up for the study by following a link from the Prolific platform to the website hosting the LIONESS experiment. They gave informed consent to the study and received the instructions that also included the framing manipulation. Participants subsequently waited in a virtual lobby to be matched with a partner. Matching took place on a first-come, first-serve basis. For a

successful matching, it was necessary that at least two participants met in the virtual lobby. Participants who could not be matched with a partner within two minutes could choose either to wait another two minutes for a match or to skip the contest and receive the basic participation fee of £ 1.50. Twenty-seven participants chose the first option—they were thanked and paid their participation fee.

After successful matching, participants completed the state competitiveness scale and started working on the first period's matrix task. After submitting their performance, participants were given a summary of the own and other's reported performance and an indication of who won the contest. The process was repeated in the second period. Afterwards, participants learned which period was selected for payment. Participants then completed the trait competitiveness scale and provided some demographic details. Finally, a detailed debriefing was provided, and subjects had the chance to leave general comments in a text field. Subjects were then redirected to Prolific and paid within one day. Completing the study took an average of 11.45 minutes (*sd* = 2.99). Average pay for those who completed the study was £ 2.50 (£ 2.00 for losers and £ 3.00 for winners).

Fourteen subjects dropped out in the course of the study due to connection loss. Two subjects could not complete the study because their opponent dropped out during the first period of the matrix task. Eight participants missed at least one of two attention check items and were therefore also excluded from further analysis. The remaining sample comprised 121 subjects (80 women, 40 men, 1 other). Their age ranged from 18 to 72, with an average of 35 years (*sd* = 13). Twelve percent indicated that their highest completed education was secondary school, 35 percent completed college, 40 percent had an undergraduate degree, and 13 percent held a graduate degree.

4. Results

4.1. Descriptive statistics

4.1.1. State and trait competitiveness

The five items comprising the ego SC scale are averaged to form an ego SC score for each subject. This score ranges from 1.2 to 7 with an overall mean of 4.76 (*sd* = 1.43). The ego SC scale is reliable with an alpha of .86. The ego TC score is formed by averaging the five desire-to-win items. This score ranges from 1 to 7 with a mean of 4.22 (*sd* = 1.41) and the scale is reliable with an alpha of .89. Ego TC positively correlates with ego SC ($r = .543$, $p <$

.001). Ego TC is a stable personality characteristic and hence unaffected by situational variations. Indeed, the data suggest that ego TC is unaffected by contest framing ($t(119) = .011$, $p = .991$) as well as cheating detectability ($t(119) = .831$, $p = .408$). Thus, the situational variations reflected by the experimental treatments do not appear to affect ego TC.

In contrast to ego TC, ego SC is subject to situational variation. Indeed, ego SC is significantly higher in the ego framing condition ($t(119) = 3.33$, $p = .001$). Cheating detectability, on the other hand, does not appear to affect ego SC ($t(119) = .427$, $p = .670$).

The literature regularly suggests that men score higher on competitiveness than women (Saccardo, Pietrasz, & Gneezy, 2018). No such sex differences are observed in the present sample—neither for ego TC ($t(118) = .502$, $p = .617$) nor for ego SC ($t(118) = 1.201$, $p = .232$).

4.1.2. Reported performance

In each period, subjects can solve a maximum of ten matrices. On average, they report to have solved 3.76 matrices ($sd = 1.92$). Table 1 depicts an overview of the conditional means.

The reported performance scores of the first and second period correlate with $r = .62$ ($p < .001$). On average, subjects report to have solved .64 matrices more in the second period ($t(120) = 3.80$, $p < .001$). Does this performance increase reflect a learning effect, or do subjects just understand that they can get away with cheating after playing the first period and therefore cheat more in the second period? To answer this question, I regress the reported performance on the period (1; 2), the cheating condition (undetectable; detectable), and their

Table 1. Subjects' average reported performance per treatment.

	Ego Framing			Task Framing			Total		
	mean	*sd*	*n*	*mean*	*sd*	*n*	*mean*	*sd*	*n*
Undetectable cheating	4.90	2.01	30	3.64	2.12	29	4.28	2.14	59
Detectable cheating	3.53	1.65	31	3.00	1.43	31	3.27	1.55	62
Total	4.20	1.95	61	3.31	1.81	60	3.76	1.92	121

Note: Reported performance is averaged over two periods.

interaction (total $F(3, 120) = 8.76$, $p < .001$). While the main effects of period and cheating detectability are significant ($t(117) = 2.48$, $p = .015$ and $t(117) = 2.49$, $p = .014$, respectively), the interaction term is non-significant ($t(117) = .48$, $p = .632$). The lacking interaction effect suggests that performance increases in the second period irrespective of cheating being detectable or not. If the performance increase was due to cheating, the reported performance in the undetectable cheating condition would have increased more, yielding a significant interaction. As this is not the case, the performance increase is likely to reflect a learning effect.

For the following analyses, the reported performance scores of the first and second period are averaged into a single reported performance score. Inspection of the histogram and a Shapiro-Wilk test suggest that the new variable is normally distributed ($W = .984$, $z = 1.028$, $p = .152$).

4.2. Does framing affect performance?

In the detectable cheating condition subjects are asked to type their answers into a text field ($n = 62$). By manually checking those answers I generate a variable with the true performance in the matrix task. Does framing affect performance in this experiment? An independent samples *t*-test indicates no performance difference ($t(60) = .964$, $p = .339$). Thus, Hypothesis 3 is rejected—task framing does not cause better performance. Instead, the results suggest that contest framing has no effect on performance in the matrix task.

In an exploratory analysis I regress true performance on framing, sex, age, ego SC, and ego TC ($F(5, 55) = 2.25$, $p = .062$, adjusted $R^2 = .095$).[11] The only coefficient reaching significance is sex ($B = 1.188$, $t(55) = 2.85$, $p = .006$), indicating that—on average—men solve one matrix more than women. Age and ego state/trait competitiveness do not predict true performance either.

4.3. Does ego framing increase cheating?

Once more, I look only at the detectable cheating condition, in which subjects typed their answers into a text field and the true performance is therefore observable. Subtracting the true performance from the reported performance indicates 15 instances of misreporting. More

[11] To warrant sensible results for the regressor "sex" one subject who identified as neither male nor female is excluded from this analysis.

specifically, five participants in the task framing condition misreport their performance in one period, respectively. In the ego framing condition, seven participants misreport their performance, three of whom misreport in both periods. Statistically speaking, however, there is no difference in misreporting between the ego and task framing conditions ($t(160) = 1.245$, $p = .218$). The *t*-test yields a similar result when the dependent variable is coded as a dichotomous indicator of misreporting. In the same vein, contest framing does not affect the reported performance significantly ($t(60) = 1.358$, $p = .180$).

So far, the analyses indicate no effect of contest framing on misreporting. This is not surprising—there is a good explanation for that result. It is likely that cheating is inhibited by its detectability. That is, subjects may feel an urge to cheat, but do not give in to it because they fear being caught and sanctioned. The Prolific platform stresses how much it values conscientious participants and reliable data. It is possible that participants feared consequences like complaints by the experimenter or exclusion from the platform. This problem is addressed by the undetectable cheating condition, which will be analyzed in the following section.

The subsample of the undetectable cheating condition comprises 59 subjects. In this condition, subjects wrote their solutions on a piece of paper, so that it is impossible for an experimenter to detect cheating. An independent samples *t*-test suggests that subjects in the ego framing condition report a significantly higher performance than subjects in the task framing condition ($t(57) = 2.351$, $p = .022$). As demonstrated in the previous section, the framing manipulation does not increase true performance. Hence, the increase of reported performance can be attributed to misreporting. In support of Hypothesis 1, this may be taken as evidence for the case that ego framing leads to cheating.[12]

To sum up, contest framing does not affect reported performance when cheating is detectable. However, ego framing is associated with higher performance when cheating is undetectable. Taken together, the evidence suggests that ego framing causes cheating.

[12] Stronger support would be provided by an interaction effect of cheating detectability with contest framing in a two-way ANOVA. However, that interaction effect did not reach significance ($F(1, 117) = 1.22$, $p = .271$).

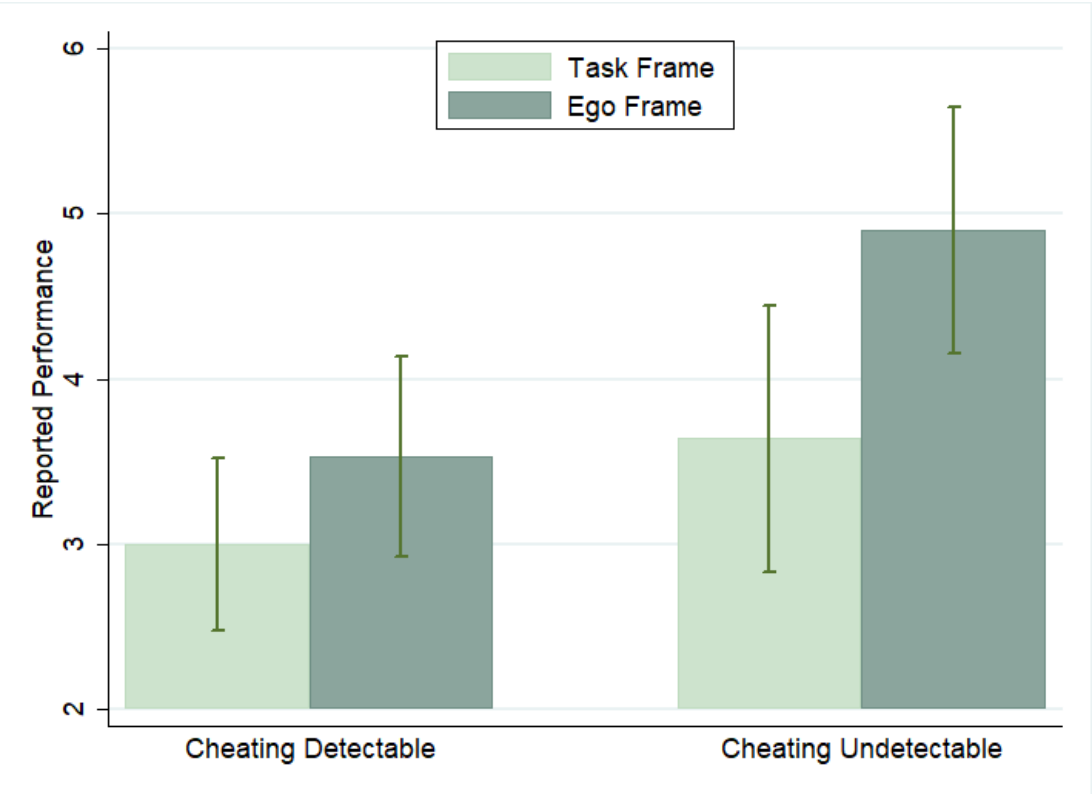

Figure 2. Mean reported performance when cheating was detectable (left panel) and when cheating was undetectable (right panel). Error bars represent 95% confidence intervals.

4.4. Testing for a mediating role of ego state competitiveness

I argued earlier that the effect of ego framing on cheating would be mediated by ego SC (Hypothesis 2). To test this hypothesis, mediation analysis is carried out on the data that were collected in the undetectable cheating condition (n = 59).

Traditionally, mediation has been analyzed by hierarchically evaluating a series of regression equations—an approach that is often referred to as the causal-steps approach (Baron & Kenny, 1986; Hayes, 2013). This approach has been criticized for being overly conservative and yielding insufficient power for small or medium samples sizes (Fritz & MacKinnon, 2007). I will therefore follow suggestions to employ structural equation modeling (SEM) and a test of the indirect effect based on bootstrapping, which is more and more becoming the standard approach in mediation analysis (Hayes, 2009; MacKinnon & Fairchild, 2009).

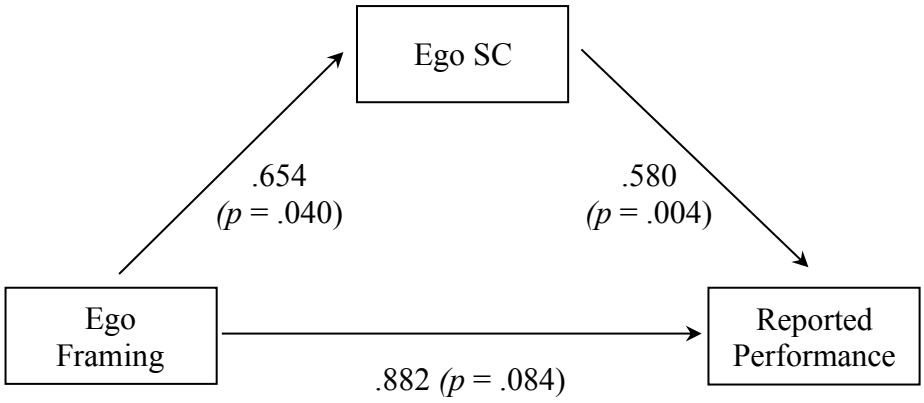

Figure 3. Path diagram of the hypothesized mediation model including unstandardized effect estimates and corresponding p-values, based on the undetectable cheating sample.

Structural equation modeling is used to estimate the unstandardized regression coefficients as depicted in Figure 3. The direct effect of ego framing adjusted for ego SC just misses significance ($p = .084$). The effect of ego framing on ego SC and the effect of ego SC on reported performance are both significant (see Figure 3). The corresponding effect of ego SC on reported performance when cheating was detectable is not significant ($B = –.062$, $p = .636$)—this indicates that the effect of ego SC on reported performance can be attributed to cheating rather than actually improved performance.

The indirect effect is the effect that ego framing exerts on reported performance via ego SC. The corresponding coefficient is the product of the two paths making up the indirect effect: (.654)(.580) = .380. As the indirect effect is a multiplication of two direct effects, the assumption of normality usually does not hold—significance testing is therefore based on bootstrapping instead of normal-based *p*-values (MacKinnon, Lockwood, & Williams, 2004). As the current sample size is relatively small, I rely on the percentile confidence interval rather than the bias-corrected confidence interval, which has been shown to come with inflated type-I-error rates in small samples (Fritz, Taylor, & MacKinnon, 2012; Hayes & Scharkow, 2013). The resulting 95% percentile bootstrap confidence interval (CI) based on 5000 repetitions is [–.012, .891]. As the CI includes zero, I have to conclude that there is no significant mediation effect. However, I acknowledge that this result is on the edge of significance. In fact, the bias-corrected CI is [.036, 1.018], thus excluding zero and suggesting a significant mediation effect. In light of such ambiguous evidence Fritz et al. (2012) recommend to take into account the direct effects whose product makes up the indirect effect. As illustrated in Figure 3, these effects are both significant, bolstering the

evidence for a mediation effect. To conclude, even if definite evidence is lacking, it is fair to say that the possibility for mediation cannot be excluded.

As the evidence regarding the indirect effect is somewhat ambiguous, it is also hard to refer to full vs. partial mediation. The non-significant direct effect in the mediation model (Figure 3) supports the notion of full mediation. However, as the corresponding *p*-value is still smaller than .1, and as the indirect effect is at the edge of significance, the situation might be better characterized as partial mediation.

Next to the ego SC questionnaire, subjects also completed a measure of task SC. However, conducting the analyses with task SC as a mediator in place of ego SC yields no significant effects. There is neither an effect of framing on task SC nor an effect of task SC on reported performance.

5. Discussion

Contests are employed to elicit increased effort, however, contests also elicit cheating (Preston & Szymanski, 2003; Rigdon & D'Esterre, 2015). When managers organize contests, they want to benefit from accelerated employee effort, but they are not keen on contestants' cheating (Preston & Szymanski, 2003). An important question thus is "how can cheating in contests be reduced?" With the present study, I set out to investigate a potential determinant of cheating in contests, namely contest framing. More specifically, I framed a contest either in terms of ego competition, which is about beating competitors and proving one's superiority over them, or in terms of task competition, which is more about improving one's skills. After an assessment of ego SC, subjects competed with each other on a problem-solving task that provided them the opportunity to cheat in order to increase their chances of winning.

The participants cheated more when they adopted ego SC—which is a focus on winning the contest and beating the opponent. Why does ego SC cause cheating? The most straightforward answer is: because cheating helps attaining the goal. As the primary goal in ego SC is to win the contest, it is reasonable to do whatever is necessary to achieve that goal—and cheating clearly increases the chances of winning. Usually, cognitive self-control mechanisms prevent us from engaging in immoral behavior that appears beneficial for attaining our current goal (Gino, Schweitzer, Mead, & Ariely, 2011; Mead, Baumeister, Gino, Schweitzer, & Ariely, 2009). Hence, moral behavior requires cognitive resources. Depletion of these resources reduces the capability of moral behavior (Gino et al., 2011;

Mead et al., 2009). This helps explaining the effect of ego SC on cheating in the current experiment: participants scoring high on ego SC were preoccupied so much with winning the contest that it took up cognitive resources which were then unavailable for exertion of self-control. Vice versa, a lack of ego SC might imply that there are enough cognitive resources available for self-control and suppression of temptations to engage in unethical behavior. Of course, this explanation is not unique to unethical behavior in contests; it applies also to non-competitive situations. For example, setting individual performance goals is associated with unethical behavior, as well (Barsky, 2008; Schweitzer, Ordóñez, & Douma, 2004; Welsh & Ordóñez, 2014).

An alternative explanation for the effect of ego SC on cheating might be that the decision to cheat was a result of a cognitive cost–benefit analysis (Basten, Biele, Heekeren, & Fiebach, 2010). Unethical behavior, such as lying, is associated with psychological costs (Gneezy, Kajackaite, & Sobel, 2018). In the presence of competition, however, the costs of unethical behavior decrease (Schreck, 2015). At the same time, the importance of winning that is associated with ego SC results in an increased benefit of cheating, as it facilitates winning. In effect, thus, the benefits weigh heavier than the costs of cheating, leading to the decision to cheat. In plain terms, ego SC causes us to think that being a loser is worse than being a cheater.

My study's results can be linked to various results from research on achievement motivation. This literature distinguishes between ego and task involvement (Nicholls, 1984, 1989; Ring & Kavussanu, 2018a). While ego involvement entails the goal of gaining superiority over others, task involvement means pursuing a personal accomplishment or improving one's competence. There is obvious overlap of this dualism with the notion of ego and task SC (Chapter 2; Chapter 3): ego SC may be thought of as ego involvement in a contest, while task SC may be thought of as task involvement in a contest. Congruent with the result that ego SC causes cheating, previous research finds that ego involvement causes cheating (Ring & Kavussanu, 2018a; Van Yperen et al., 2011) and antisocial behavior (Sage & Kavussanu, 2007). While this research takes place mostly in the sports or education domains, Van Yperen et al. (2011) suggest that ego involved people have even more cheating intentions in the work domain than in the sports domain. On a more general level, ego orientation (comparable to ego TC) is associated with reduced moral functioning (Kavussanu & Ntoumanis, 2003). Thus, the present study's results align well with findings from achievement motivation literature, particularly ego involvement.

This study also constitutes an important contribution to the literature on competitiveness (see Chapter 2; Houston et al., 2002). While this literature has traditionally understood competitiveness as a rather stable trait factor (Bönte, Lombardo, & Urbig, 2017; Newby & Klein, 2014), the present study focused on a situationally dependent concept, namely ego SC (Chapter 2; Hartmann & Schreck, 2018). The idea behind ego SC is that, unlike ego TC, it varies in response to the situational context, such as the specifics of the respective contest. The present study is one of the first to empirically demonstrate this volatility of ego SC (cf. Chapter 3). In addition, ego SC could be clearly distinguished from ego TC, which showed no situational variation. This distinction is important because—unlike the traditional ego TC, which can merely explain behavior—ego SC opens up opportunities to change behavior. This study thus constitutes a pioneering example for the utilization of ego SC to reduce cheating in contests.

Utilizing ego SC for reducing unethical behavior requires a method to regulate ego SC in contestants. The present study delivers this method. Specifically, emphasizing task competition, i.e., the opportunity for personal development and enjoyment of the task, decreases ego SC and thereby causes more honest reporting. This manipulation is not extreme—it is merely a difference in wording. Hence, not only is ego SC context dependent; it is even relatively easy to influence people's ego SC level by means of framing. This result is in line with achievement motivation research that employs similar framing interventions to alter ego involvement. For instance, Sage and Kavussanu (2007) study people's moral behavior during repeated table soccer matches. They successfully manipulate participants' ego involvement by stressing the importance of winning the table soccer matches and showing a top ten player ranking. In contrast, the authors target task involvement by emphasizing learning and gauging success in terms of subjects' improvement over the two matches. In a laboratory experiment, Van Yperen et al. (2011) successfully imposes ego involvement on subjects by recommending them explicitly to try performing better than the other participants (as opposed to trying to improve the own performance). The intervention is enhanced by a subsequent task in which subjects have to write a few sentences about the assigned goal. Taken together, the present study's framing effect aligns well with related research that successfully employed similar framing manipulations.

Another important aspect is that contest framing reduces cheating without affecting task performance. This is rather unique: other widely studied contest characteristics—such as prize spread—may be associated with ego SC and cheating, but they are also linked to performance (Chapter 3; Harbring & Irlenbusch, 2011). This makes it unappealing for

organizations to reduce the prize spread as a measure against cheating. The here presented factor contest framing does not have these downsides: it appears to reduce cheating without affecting performance, thereby making it a feasible way for contest organizers to decrease the amount of cheating among contestants.

Though not being a primary concern of this study, it is noteworthy that neither ego TC nor ego SC were affected by gender. This result is surprising, because the vast majority of the literature reports that men score higher on competitiveness scales than women (Saccardo et al., 2018). However, the correlation of ego TC and SC is indicative of correct measurement. Hence, it is most likely that the sample happened to comprise women and men who were overall equally competitive.

6. Management implications

Competition between employees is ubiquitous in today's organizations (Cowgill, 2015). A major drawback of competition is that it often causes unethical behavior such as cheating (Belot & Schröder, 2013). Be it sales contests, promotion tournaments, or any other form of competition between employees—cheating, and unethical behavior in general, is usually disadvantageous for all parties but the cheater. The present study suggests that managers can reduce cheating by framing contests in terms of task rather than ego competition. Thus, corporate communications on contests should neither include a degrading view on competitors, nor stressing the possibility for contestants to demonstrate their superiority or others' inferiority, nor emphasizing the importance of winning (Houston et al., 2002; Ryckman et al., 1990; Tassi & Schneider, 1997). Instead, internal communications should emphasize the opportunity for contestants to improve their skills and develop personally, as well as a positive view of competitors as facilitators of personal discovery (Houston et al., 2002; Ryckman et al., 1996; Tassi & Schneider, 1997). Possible channels where contest framing may play a role include traditional print publications, such as magazines and posters, face-to-face communication, as well as online media, including emails, intranet, social networks etc. (Gillis, 2006). If contests are always framed in terms of task competition, this language is likely to be adopted and assimilated by the employees, thereby increasing ethical behavior as demonstrated in this study (Mayer, Kuenzi, Greenbaum, Bardes, & Salvador, 2009).

7. Limitations and future research opportunities

A few limitations should be taken into account when interpreting this study's results. To begin with, the effect of ego framing on cheating is not confirmed by the respective interaction effect of a two-way analysis of variance. This points to the relatively low reliability of the effect. Similarly, the mediation effect of ego SC is merely at the edge of significance. By statistic conventions, thus, the evidence does not provide reliable support of the hypotheses. Nonetheless, the overall picture suggests that the hypotheses cannot be clearly dismissed either. Consequently, replication studies are needed to substantiate this study's claims.

The contest framing emphasizes either ego or task competition. Participants who are subjected to the ego framing adopt ego SC. One might expect that, in the same vein, participants subjected to task framing would adopt task SC. However, this is not the case. Previous studies, too, fail to manipulate task SC (Chapter 3) or comparable concepts (i.e., task involvement; Ring & Kavussanu, 2018a, 2018b). A possible explanation for the lacking relation between task framing and task SC is that task SC is not as readily imposed on people as ego SC. Task SC involves a genuine interest in the task, coupled with the motivation to excel in this task. In other words, the task must be important to the actor for him to experience task SC. Opposed to that, experimental tasks such as the one used in the current experiment are probably not interesting enough to elicit task SC among the participants. Alternatively, it is also possible that the instrument I used to assess task SC was no adequate tool for that purpose (Chapter 3). However, this possibility is contradicted by the fact that other research fails to manipulate task involvement, as well (Ring & Kavussanu, 2018a, 2018b). In any case, more research is needed to advance understanding of task SC, its relation to cheating, and the possibilities to manipulate it.

Another opportunity for future research lies in exploring alternative ways of reducing ego SC in contests. Alternative ways of reducing ego SC would constitute alternative ways of reducing cheating in contests. Finding feasible ways of reducing ego SC is no straightforward task, though. As an example, consider the factor prize spread—the difference between winner and loser prize (Connelly et al., 2014). A lower prize spread is associated with more ethical behavior, and this effect could be mediated by ego SC (Harbring & Irlenbusch, 2011). However, decreasing the prize spread would not only decrease unethical behavior but also effort—which makes it an unfeasible option for most organizations, who typically organize contests to increase employee effort (Harbring & Irlenbusch, 2011). A more feasible

alternative could be the transparency about one's current rank (Gürtler, Münster, & Nieken, 2013). If the current ranking of contestants is made transparent during the contest, this may make winning and beating the competitors more salient, thereby increasing ego SC. In line with that argument, Gürtler et al. (2013) demonstrate experimentally that disclosing the ranking during a contest can be detrimental for ethical behavior and performance. Taken together, it may be worth testing whether concealing the current ranks increases ethical behavior and performance via lower ego state competitiveness. But future research may also consider the effect of contest attributes that have not yet been linked to ego SC or unethical behavior. Possible factors include the duration of the contest, the kind of prize (e.g., promotion, merchandise, cash), and the value of the prize in terms of the proportion of the normal income (Connelly et al., 2014; Murphy, Dacin, & Ford, 2004).

The literature often differentiates between two categories of unethical behavior aimed at getting ahead in contests: cheating and sabotage (Preston & Szymanski, 2003; Rigdon & D'Esterre, 2015, 2017). While cheating involves illegitimate ways of increasing one's performance measures, sabotage refers to illegitimate ways of reducing the performance scores of competitors (Preston & Szymanski, 2003). The present study was about cheating, but to generalize the results, future research should replicate the findings with sabotage as the outcome. Moreover, to corroborate and generalize the result that contest framing does not affect task performance future research should replicate the experiment using different experimental tasks.

All in all, adopting task framing appears to be a promising way of reducing cheating in contests without compromising performance—provided that this study's results replicate in future research.

8. Appendix: Experimental Instructions (Excerpt)

Ego Framing	Task Framing
In a competitive setting, the absolute performance counts not so much as **ranking first**, that is, **winning**. By winning, competitors demonstrate **superiority over their opponents**. You have to **beat the opponent** to come out on top. In a sense, the opponents may be understood as **obstacles** in the way—they must be **eliminated**. Hostility towards opponents can thus be justified to some extent. Moreover, winning implies an increase in status and power, which is why we sometimes desire to **win at any cost**. Ultimately, the focus in a competition or contest lies in exceeding the opponents and to validate one's **superiority**. (…) A few more words about the numbers task: It is a simple scenario—you compete with one opponent and the one with the higher performance is the winner. It is a straightforward way to demonstrate your superiority, at least in the numerical reasoning domain. This is a typical contest where winning is the most important thing.	Competitions or contests provide particularly suitable opportunities for enhancing your skills, **mastering the task** at hand, and ultimately **personal growth**. The presence of a competitor may stimulate you to push yourself to the limit more than you would do alone and consequently accomplish **extraordinary achievements**. The other contestant should thus be appreciated for **facilitating your performance** by challenging you. Contests also enable **self-discovery**: Learning about your relative strengths (and weaknesses) provides you with **valuable information** about how to define yourself. And certainly, next to **improving yourself** it is most important to **have fun** in a contest. (…) A few more words about the numbers task: It is a simple scenario—you compete with one other contestant. The task itself is an amusing way of discovering and developing your cognitive skills. More specifically, it can be used to train numerical reasoning. So the task should allow you to learn something whilst having some fun at the same time.

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CHAPTER 5

General Discussion

1. Summary of key findings

This dissertation emerged from the problem that contests are widely used in organizations to motivate employees despite known downsides. The downside of interest was the occurrence of unethical behaviors aimed at increasing one's rank in an illegitimate way. The purpose of my studies was to find a method of reducing unethical behavior without compromising the desired positive effects on employee effort. A literature review served as the basis and clarified where I had to look for opportunities to reduce unethical behavior in contests (Chapter 2). In the second paper I further advanced the concept state competitiveness and developed a brief self-report instrument to assess it during contests in research studies (Chapter 3). Finally, the third paper reported a study suggesting that ego state competitiveness may indeed be manipulated, thereby mitigating unethical behavior in contests (Chapter 4). Let me briefly point out the key findings of the three research projects.

While there is some debate as to whether or to what extent contests are really beneficial to employee effort, it is largely undebated that cheating and sabotage are undesired side-effects of competition. There appears to be much more ambiguity with respect to specific determinants of unethical behavior in contests. The literature review in the second chapter includes over 30 studies that suggest effects or no-effects on sabotage and cheating in

contests. While some rather clear effects emerge for extensively studied factors such as prize spread or gender, other potential determinants—such as the number of contestants—yield no conclusive evidence.

The literature review also yields a useful framework of behavior in contests. The framework is based on an inductive approach and identifies five elements in the empirical literature on unethical behavior in contests—contest attributes, person attributes, situation attributes, affective state, and behavior. The value of this parsimonious framework lies in its ability to illustrate the enormous variety of findings from different fields that study contests. For example, the results from Chapter 4 can be appropriately illustrated in terms of the framework: contest framing would pertain to the contest factors, and it would lead to an affective state, namely ego state competitiveness. Ego state competitiveness, in turn, would predict the outcome behavior—in this case cheating (Chapter 4). No moderating factors were tested in Chapter 4. While the framework focuses on unethical behavior as the outcome, it could be easily adapted to depict and to study determinants of a different behavioral outcome of contests, such as effort, job satisfaction, or psychological well-being (Brandts, Riedl, & Van Winden, 2009; Standage, Duda, & Pensgaard, 2005).

The framework points to the interesting yet understudied concept of state competitiveness. A key element of this dissertation is the consolidation of various two-dimensional trait competitiveness accounts and its transfer to the concept of state competitiveness. As a result, the concept is divided into ego and task state competitiveness. Ego state competitiveness (ego SC) reflects someone's current focus on beating other contestants and task state competitiveness (task SC) reflects someone's current focus on personal development and self-improving in the contest.

Based on exploratory factor analysis, I develop a brief self-report instrument to measure both state competitiveness dimensions in research participants (Chapter 3). To my knowledge, this instrument constitutes the first attempt at measuring two-dimensional state competitiveness. Utilizing this state competitiveness scale, I show that ego SC can be manipulated by changing certain details of the contest. Specifically, increasing a contest's prize spread leads to higher ego SC among participants (Chapter 3). A similar effect is demonstrated for contest framing: framing a contest in terms of ego competition leads to higher ego SC among participants (Chapter 4). But my studies show not only that ego SC is subject to manipulation, they also suggest that ego SC is associated with cheating: people who are put into a state of high ego competitiveness also tend to cheat more (Chapter 4). Taken together, Chapter 4 suggests that a careful choice of wording may reduce contestants'

ego SC and thereby also cheating. Importantly, in the experiment the wording appears to have no effect on task performance. These results, however, must be understood as preliminary evidence—crucial effects like the indirect effect of ego framing via ego SC on cheating are only marginally significant and must be corroborated by future research.

2. Discussion of key findings

At the outset I stated that the goal of my dissertation was to find a way of reducing unethical behavior in contests. To that end, I argued, it was necessary to understand what determines unethical behavior. In a second step, I wanted to utilize the determinants to reduce unethical behavior. In more specific terms, this research was designed to understand how the specifics of a contest cause cheating and sabotage and to use that knowledge to mitigate unethical behavior. In the following section I will lay out to what extent this goal was attained.

2.1. Unethical behavior can be mitigated by modifying specific contest attributes

Was I successful in finding a method to reduce unethical behavior in contests? The short answer is yes: to the extent that task framing decreases cheating I found a way of reducing unethical behavior in contest. Part of the long answer is that the corresponding statistical effects are not exactly textbook examples—that is, some effects leave room for interpretation and are therefore attackable. Looking at the big picture, however, allows some confidence in the notion of state competitiveness and its explanatory power for unethical behavior. And while the effect of contest framing on ego SC and cheating dominates the thesis to some extent, the results of Chapter 2 and 3 are as important as the "final test" in Chapter 4.

The literature review contributes much to the attainment of the principal research goal (Chapter 2). Reviewing the literature yields the framework which forms the basis for the later experimental research. The framework identifies and isolates five crucial categories of variables in explaining behavior in contests: contest attributes, attributes of the person, attributes of the situation, affective state, and (unethical) behavior. Two of these categories play a particularly important role for the remainder of the research project, namely contest attributes and affective state. Why are these two categories so important and in which way does this dissertation contribute to their advancement? To put it simply, these two categories are important because they include variables that can be directly (contest attributes) or indirectly (affective state) controlled by the contest organizer. As such, a particular practical

relevance inheres in these categories. This is in contrast to attributes if the person, such as trait competitiveness, which is a stable individual difference variable and as such not readily altered (Hamaker, Nesselroade, & Molenaar, 2007). Attributes of the situation, as reflected in the framework, include variables that are typically not controlled by the contest organizer, such as organizational culture or a rivalry with a specific competitor (Chapter 2).

The framework's affective state component includes variables that describe the contestant's current state or condition. In contrast to contest or situation attributes, affective states describe internal concepts, processes that take place inside the competing person. And in contrast to the more stable person attributes, affective states are momentary and situation dependent. In the context of competition, the bulk of the literature focuses on one of two state aspects: competitive arousal, which mainly reflects a physiological condition of action readiness in contests, and state competitiveness, which reflects a contestant's motivation to exert effort in a contest. The latter concept—state competitiveness—became a key component for my research for various reasons. First, a person's internal motivational state is a very proximal predictor of behavior compared to the more distal predictors that the framework subsumes under the attributes of the contest, person, and situation. As such, the discussion of state competitiveness promised to advance understanding of behavior in contests and to make more precise predictions than the other three components could yield. Second, state competitiveness promised to yield new insights because it is a novel concept. There have been occasional mentions of state competitiveness, and a few researchers have taken state concepts into account when explaining behavior in contests (Kilduff, Galinsky, Gallo, & Reade, 2016; Malhotra, 2010). However, prior to our literature review no one has consolidated this research into one category. After completing this step, it was natural to study the new concept in more detail. The third reason for the study of state competitiveness was its ability to disentangle the motivations for increased effort and unethical behavior. Prior to this dissertation, research had demonstrated that competition increased both effort and unethical behavior. Larkin and Pierce (2015) have called this the "inseparability of productive and counterproductive behavior." Specific determinants such as prize spread had been shown to affect effort and unethical behavior in much the same manner. Against this background, state competitiveness promised to explain the circumstances under which contestants employ effort versus unethical behavior to win. Disentangling the two was important in order to reduce one (unethical behavior) without affecting the other (effort/performance).

By identifying and studying the concept state competitiveness, the present research significantly advances understanding of unethical behavior in contests. In their entirety, the results of my research suggest that ego SC is an important link between various attributes of the contest, the person's trait competitiveness, and unethical behavior. Specifically, ego SC was shown to be associated with two contest attributes (i.e., prize spread and contest framing), one person attribute (i.e., trait competitiveness), and one case of unethical behavior (i.e., cheating). These results all contribute to the answer of the overall research question of how to mitigate unethical behavior in contests. To put it straight, my research suggests that unethical behavior can be reduced by reducing ego SC. To reduce ego SC different interventions are conceivable, and I tested two of them. The result: reducing the prize spread and framing the contest in terms of task competitiveness both decrease ego SC. A practical disadvantage of reducing prize spread, however, is that it also reduces effort among contestants (Harbring & Irlenbusch, 2011). In contrast, task framing does not affect performance and thus appears to be a more viable way of diminishing cheating than reducing the prize spread. In that sense, the overall research goal of finding a way of reducing cheating in contests was attained.

The role of contest factors in the framework of unethical behavior in contests is worth discussing, too. The literature review yields a list of contest attributes that have been studied with respect to unethical behavior. The list could now be extended by the factor contest framing, which was first studied in Chapter 4. In important question is whether ego SC really mediates all effects of contest attributes on unethical behavior. To test this claim, more contest attributes have to be studied in combination with ego SC and unethical behavior. Of course, the list in Chapter 2 is not exhaustive—other contest attributes are conceivable as well. It would be valuable to identify more determinants of ego SC. Other determinants are potential additional tools to reduce unethical behavior. Moreover, the factors might be combined, so that the resulting contest design would decrease cheating even more. But additional studies involving ego vs. task framing would be just as valuable: as my research can only point at the possibility of influencing ego SC and cheating by means of contest framing, more research is needed to corroborate this effect with different tasks and in different contexts, including field settings.

2.2. The usefulness of task framing hinges on the independence of performance

My work suggests that contest organizers should use task framing rather than ego framing to keep down levels of unethical behavior. This advice hinges on the prerequisite that such an intervention does not affect performance negatively. While previous research has shown that smaller prize spreads can reduce unethical behavior, it reduces effort at the same time (Harbring & Irlenbusch, 2011). This is an obvious disadvantage of utilizing prize spread to reduce unethical behavior—contest organizers would have to trade off effort against ethical behavior. In contrast, I did not find such a parallel relationship in the case of ego vs. task contest framing. While this is a valid indication, additional research is needed to corroborate the finding.

The previous paragraph looks at the *direct* effects of contest attributes on performance (see Figure 1 in Chapter 2 for an overview of contest attributes). A key idea supported by my research is that contest attributes cause state competitiveness which in turn explains unethical behavior. In much the same way, contest attributes may affect *performance* via state competitiveness. My study (Chapter 4), however, indicates that neither ego nor task SC have an effect on performance in the matrix task. Similarly, research on achievement goals finds only a small effect of task involvement on performance (Cervelló, Santos Rosa, Calvo, Jiménez, & Iglesias, 2007). While I am not aware of research on the effect of ego vs. task trait competitiveness on performance, there is literature on the effect of one-dimensional competitiveness on performance. For instance, some studies on sales performance indicate a positive effect of competitiveness on performance (Lam, 2012; Wang & Netemyer, 2002). However, Krishnan, Netemeyer, and Boles (2002) note that the effect of competitiveness on performance is sometimes small or holds only under specific conditions. Indeed, a meta-analysis of 65 studies that investigated the link between trait competitiveness and performance suggests that all in all, the effect is significant albeit extremely small in magnitude (Murayama & Elliot, 2012). When only the studies conducted in a work context are considered (i.e., not the school or sports domain) increases the effect size. Even though the authors do not explicitly comment on two-dimensional competitiveness, they appear to have included ego trait competitiveness (hypercompetitiveness; Ryckman, Hammer, Kaczor, & Gold, 1990) but not task competitiveness. I would argue, however, that it is not justified to assume that traditional one-dimensional accounts of competitiveness correspond to ego competitiveness more than to task competitiveness. Instead, descriptions of one-dimensional competitiveness and the respective scales often include elements of both, ego and task

competitiveness. For example, the widely used four-item scale of trait competitiveness developed by Helmreich and Spence (1978) contains an item about winning, which would be associated more with ego competitiveness ("It is important to me to perform better than others on a task"), as well as an item about enjoyment, which would be associated more with task competitiveness ("I enjoy working in situations involving competition with others"; items reproduced as in Brown, Cron, & Slocum, 1998). To summarize the matter with performance: there is a lack of research on the effects of two-dimensional state *and* trait competitiveness on performance. This gap presents plenty of research opportunities. Such research is needed for a fuller understanding of the role of state competitiveness, and particularly to evaluate the practicality of interventions targeting state competitiveness. Any intervention that reduces unethical behavior is impractical if it also reduces performance.

2.3. Practical differences between ego and task state competitiveness

In conceptualizing ego vs. task SC, the two dimensions play an equally important role. My studies suggest, however, that in practice ego SC is much more relevant than task SC. The initial hypothesis was that task SC would cause more ethical behavior in contests, because unethical behavior would not contribute to attaining the primary goal of personal development (Chapter 1). However, this claim was not empirically supported in my studies. Task SC could not be shown to reduce unethical behavior. The main reason for this gap is the difficulty of inducing task SC in experiments. Without a successful manipulation of task SC, it is not possible to detect a possible effect on unethical behavior or performance.

I am not the only one encountering this problem with task SC: research in the field of achievement goals reports difficulties with manipulating a similar concept, namely task involvement (Ring & Kavussanu, 2018a, 2018b). What makes task SC more difficult to elicit than ego SC? A possible explanation lies in the fact that the person has to be genuinely interested in the task. According to various characterizations of task TC, someone experiences task competitiveness if her primary goal is to self-improve in the respective task (Ryckman, Hammer, Kaczor, & Gold, 1996; Tassi & Schneider, 1997). Thus, a prerequisite for task SC is a real interest in the task, a certain importance of the task to the self. The typical task used in experimental research may be simply not compelling enough to sufficiently stimulate people's interest (Bönte, Lombardo, & Urbig, 2017). More sophisticated experimental tasks might elicit task SC in the laboratory. Once more looking to achievement goal research, Sage and Kavussanu (2007) successfully manipulate task

involvement in a table soccer task. The authors implement goal involvement manipulations within a slide show that is presented to participants before they play two matches of table soccer. In the task involving condition the slides contain advice on how to improve the skills of passing, controlling, and kicking. Performance improvement over the two games is rewarded with a raffle ticket. In the ego involving condition the slides contain advice on how to outperform opponents. In this condition, a raffle ticket is awarded for scoring more goals than the opponent and for making it onto the all-time top-ten leader board. A similar manipulation is employed by Standage et al. (2005)—here, subjects receive the ego and task involvement manipulations in form of pre-recorded tapes, and the task is a computer dance game. Both studies suggest that the manipulation indeed causes ego vs. task involvement. This points to the possibility that a similarly compelling task might be suitable for producing task SC. Thus, future research should take into account the necessity of an interesting research task for stimulating task SC.

Another important aspect concerns the precision of the conceptualization of ego and task SC. Previous research on trait competitiveness does not agree on a clear definition of ego vs. task competitiveness. Various authors find empirical support for a dichotomy (Houston, McIntire, Kinnie, & Terry, 2002), but none of them really defines the key aspects of the concepts. Instead, they outline the concepts with more or less comprehensive descriptions and examples. An overview of some prominent characterizations of task vs. ego TC was provided in Table 1 in Chapter 3. Such descriptions give researchers a largely appropriate feel for the concept, however, for its measurement and empirical study, the descriptions are not precise enough and vary within the literature. Due to the lack of a clear-cut definition of ego vs. task TC, existing scales for ego vs. task TC are comparable only to a limited extent—the concepts that these scales are designed to measure are not necessarily congruent. Moreover, as I derive the two-dimensional state competitiveness concept from said trait competitiveness concepts (Hamaker et al., 2007), the conceptualization of state competitiveness can be only as precise as the conceptualization of trait competitiveness.

If future attempts should be made to further refine competitiveness measurement, I suggest two considerations. First, ego vs. task TC should be clearly defined, for instance in terms of a few key characteristics of each dimension. The definition should take past empirical work on competitiveness into account. In addition, it might be fruitful to make the definition compatible with the related concepts studied in achievement goal research (Nicholls, 1989; Ring & Kavussanu, 2018b; Standage et al., 2005). Specifically, trait competitiveness would correspond to goal orientation and state competitiveness would

correspond to goal involvement (Nicholls, 1989; Ring & Kavussanu, 2018b). Self-evidently, the definition of ego vs. task TC must be accompanied by an according definition of ego vs. task SC. This brings me to my second point: I would suggest constructing brief commensurate trait and state competitiveness scales in tandem, to ensure common correspondence to the theory. The resulting instrument would be a 2x2 scale, measuring ego vs. task and trait vs. state competitiveness. This is not saying that trait and state competitiveness should be assessed on every possible occasion. But congruently constructed instruments would facilitate comparability and promote validity of trait and state competitiveness.

To conclude this aspect—until the task SC subscale is validated and evidence for the positive effects of task SC empirically supported, ego SC remains the more relevant concept. Cheating in contests is explained by ego SC, while a link with task SC could not be established yet.

2.4. Shortcomings of instruments for measuring ego and task trait competitiveness

In reviewing instruments for measuring ego and task trait competitiveness, various shortcomings in those scales' development become apparent. As the measurement of competitiveness is a key element of my research and as I use ego and task trait competitiveness scales in Chapters 3 and 4, some of these weaknesses are worth a discussion. The most prominent scales of ego and task competitiveness (in terms of number of citations) are the hypercompetitive attitude scale (Ryckman et al., 1990) and the personal development competitive attitude scale (Ryckman et al., 1996), respectively. The hypercompetitive attitude scale is ineligible for assessing ego trait competitiveness because it comprises some items that do not reflect ego trait competitiveness as laid out in Chapter 2 and 3 (e.g., "I compete with others even if they are not competing with me" or "I do not try to win arguments with members of my family"; Ryckman et al., 1990, p. 633). The personal development competitive attitude scale corresponds well to task trait competitiveness, however, with 15 items it is a rather long instrument (Ryckman et al., 1996).

A different scale is constructed two-dimensionally, with subscales corresponding to task and ego competitiveness (Competitiveness Questionnaire; Griffin-Pierson, 1990). This scale includes an item that loads .36 on both factors, as well as an item that "loads" .07 on the its target factor. These flaws are so severe that they raise the question why factor analysis is employed at all. Consequently, this scale is not employed in my studies, either.

Other competitiveness measures comprise four or five subscales (Franken & Brown, 1995; Newby & Klein, 2014). The Competitiveness/Mastery Questionnaire by Franken and Brown (1995) comes with some oddities on its own. For instance, the authors report that the factor structure emerged only for the male data; the female data did not differentiate between the first two factors (i.e., improving performance and desire to win). Moreover, the authors report an alpha of only .45 for the "improving performance" subscale, a value far beyond each common threshold value for an acceptable reliability estimate (Cortina, 1993). The authors also employ the criticized practice of retaining the first couple of factors and simply delete the remaining items (Clark & Watson, 1995). I still use Franken and Brown's subscales "improving performance" and "desire to win" for measuring task and ego TC, mainly because the scales are relatively short yet face valid representations of trait competitiveness as conceptualized in Chapter 2 and for want of a better alternative (Houston et al., 2002; Ryckman et al., 1990, 1996; Tassi & Schneider, 1997).

Lastly, let me point out two aspects with respect to the competitive orientation measure by Newby and Klein (2014). Despite taking many steps that testify to a methodologically sophisticated scale development process, the authors appear to have neglected item content and theory about competitiveness to some extent. The subscales are not commensurate with each other—for example, the dominant competitiveness subscale (corresponding to ego competitiveness) comprises 13 items, while the personal enhancement competitiveness subscale (corresponding to task competitiveness) comprises only four items. Various items are highly similar to another item—for instance, the competitive affectivity subscale includes the items "Winning makes me feel superior to others" and "Winning does not make me feel superior to others." By including highly similar items, the scale becomes reliable (*alpha* = .87), without adding much information (Clark & Watson, 1995).

In sum, most of the competitiveness scales that I had a closer look on have weaknesses, which can be considered severe in some cases. This puts the weaknesses of the state competitiveness scale into perspective and suggests that a valid instrument for measuring ego vs. task trait competitiveness remains to be developed.

2.5. How the present results add to various research strands

Overall, my studies directly add to different strands of research. For example, they extend the literature on trait competitiveness and its measurement (Bönte et al., 2017; Fallucchi, Nosenzo, & Reiben, 2019), and in particular two-dimensional trait competitiveness (Houston

et al., 2002; Ryckman, Libby, van den Borne, Gold, & Lindner, 1997; Schreck, 2015; Tassi & Schneider, 1997). While these studies on trait competitiveness stress the role of personality characteristics, my research suggests that it can be fruitful to study trait competitiveness in tandem with situational factors—which is reflected in the concept of state competitiveness. State competitiveness combines person and situation characteristics and thereby constitutes a precise predictor of behavior. Based on survey results, Mudrack, Bloodgood, and Turnley (2012) suggest that ego trait competitiveness is associated with poorer ethics than task trait competitiveness. My research corroborates and extends Mudrack et al.'s results by explaining the effect of ego trait competitiveness on unethical intent with ego SC.

My research makes another important addition to the competitiveness literature in demonstrating the value of the two-dimensional conceptualization of competitiveness. In contrast to multi-dimensional accounts of competitiveness, the distinction between ego and task competitiveness is theoretically consistent in the sense that both dimensions represent a motivation behind competing. The competitiveness orientation measure (Newby & Klein, 2014) or the competitiveness/mastery questionnaire (Franken & Brown, 1995), comprise four and five dimensions, respectively. These dimensions, however, do not reflect a common underlying concept. The dimensions are based on factor analysis on self-report items about competitiveness and related concepts—there is no unifying theory behind the components. In contrast, the value of the two-dimensional approach is further endorsed by its explanatory power: differentiating between ego and task competitiveness allows the simultaneous explanation of ethical and unethical behavior in contests—the task competitiveness link admittedly still needs empirical verification. Nonetheless, these features make the two-dimensional account of competitiveness more useful than multi-dimensional versions. It is worth mentioning that one-dimensional competitiveness concepts are still practical for assessing people's general eagerness to participate in contests, i.e., their preference for competition (Fallucchi et al., 2019).

In a broader sense, the results of my studies also add to the discussion of tournament theory (Connelly, Tihanyi, Crook, & Gangloff, 2014; Lazear & Rosen, 1981), particularly to a behavioral ethics perspective on tournaments (Conrads, Irlenbusch, Rilke, Schielke, & Walkowitz, 2014; Harbring & Irlenbusch, 2008, 2011). Specifically, research suggests that certain elements of tournaments, such as the prize spread, are associated with unethical behavior (Conrads et al., 2014; Harbring & Irlenbusch, 2011). The present research adds to this strand of literature by providing an explanation for the reported effect of prize spread on unethical behavior.

I occasionally pointed out parallels between competitiveness and achievement goal research (Nicholls, 1989; Ring & Kavussanu, 2018b; Standage et al., 2005). The present studies add to this strand of literature, as well. Ego vs. task involvement roughly reflect the motivation to perform better than others vs. better than before. The key difference to state competitiveness is that goal involvement may occur in the absence of competition, i.e., negative goal interdependence (Deutsch, 1949). Ego and task SC may be understood as ego and task involvement during a contest. Due to these parallels, the literatures on state competitiveness and ego involvement can benefit from each other in the form of cross-validating research results or simply by broadening one's view on the respective concept.

3. Evaluation of findings for practice

The literature on contests in organizations mostly revolves around either sales contests (Poujol, Harfouche, & Pezet, 2016; Verbeke, Bagozzi, & Belschak, 2016) or promotion tournaments (Connelly et al., 2014; Lazear & Rosen, 1981). In a sales contests, salespeople compete for a specific short-term incentive that is added to their normal wage (Moncrief, Hart, & Robertson, 1988). In promotion tournaments, the employees compete for a promotion to a more senior job level or a salary raise (Connelly et al., 2014). Such promotion tournaments appear to be very common among today's organizations: in an online survey among 15,540 respondents, 41.6% state that their last real wage increase was due to better performance compared to their colleagues (Cowgill, 2015). These promotion tournaments are regularly utilized to stimulate higher performance (DeVaro, 2006).

The literature review in Chapter 2 suggests that contest organizers should keep in mind that there are various risk factors that increase the likelihood of unethical behavior in contests. Some of those risk factors are under the control of the contest organizer. For example, a large prize spread or ego framing can increase unethical behavior (Chapter 2 and 4). Accordingly, contest organizers might want to keep in mind that a larger prize spread can stimulate extra effort but may stimulate unethical behavior at the same time. Framing the contest in terms of task competition is an easy intervention that could become standard in any contests. As it stands, task framing comes at no cost to performance and decreases chances of employee cheating. The costs of implementation are minimal as well. Nevertheless, future research must corroborate the effect of task framing to bolster the legitimacy of this advice.

Other risk factors are usually beyond the control of the contest organizer. For instance, the perceived ethical climate in the organization or the rivalry of two specific

contestants (Chapter 2). Possible implications could be not to organize a sales contest if it is known that employees generally perceive the organizational climate to be unethical (Hochstein, Zahn, & Bolander, 2017; Poujol et al., 2016). Similarly, it may be good advice to pay extra attention to potentially unethical behavior by rivals in a promotion tournament (Kilduff et al., 2016).

At this point it should be noted that there are adverse effects of competition that have not been touched by my studies. For instance, research suggests that competition may have negative effects on contestants' well-being (Brandts et al., 2009; Standage et al., 2005). Standage et al. (2005) demonstrate that ego involving contests cause higher levels of negative affect while task involving contests cause higher levels of need satisfaction and subjective well-being. Another aspect concerns the behavior of contestants after a contest is over. Experimental research participants rarely meet again after a contest. In contrast, employees usually keep working with the others, and research suggests that contestants punish their competitors even after the contest is over (Jauernig, Uhl, & Luetge, 2016). Finally, while some people score high in competitiveness and enjoy competing, it is important to notice that there are many individuals who dislike competition and for whom contests represent a stress situation (Salvador & Costa, 2009). Repeated or long-term exposure to stress has adverse health effects and has been related to major depressive episodes (Hammen, 2005; Pearlin, Menaghan, Lieberman, & Mullan, 1981). In addition, people who are not competitive are likely to be dissatisfied with the tournament-based incentives at work. Such dissatisfaction is generally associated with increased counterproductive work behavior (Enns & Rotundo, 2012; Kelloway, Francis, Prosser, & Cameron, 2010; Larkin & Pierce, 2015; Moon, Scullen, & Latham, 2016). Note that counterproductive work behaviors can include the same behaviors that I discussed as unethical behavior aimed at increasing one's chances of winning. However, counterproductive work behavior is per se not instrumental, i.e., it does not necessarily help the actor to rank higher in the contest.

A more detailed discussion of the varied consequences of competition among employees would be a research project in itself and is beyond the limits of the present dissertation. However, the glance at some adverse effects of competition demonstrated that managers must keep many aspects in mind when establishing contests or competitive environments among employees. The potential costs must be weighed carefully against the benefit of competition among employees.

4. Conclusion

While competition among employees is implemented in many organizations to stimulate effort, it is associated with unethical behavior aimed at increasing one's chances of winning (Charness, Masclet, & Villeval, 2014; Cowgill, 2015; DeVaro, 2006). This research project was set up to tackle the issue of unethical behavior during competition among employees. Specifically, I aimed at finding a way that would reduce unethical behavior without compromising task performance in a contest. At the outset, a review of the literature yielded a framework of unethical behavior in contests. Using this framework, I identified the understudied concept of ego vs. task SC and its role for unethical behavior in contests. To be able to measure the concept, I developed a psychometric instrument comprising ten self-report items. Finally, based on the insights into ego and task SC, I devised a method that helps reducing unethical behavior in contests: specifically, framing the contest in terms of task competition appears to decrease cheating, possibly via reduced ego SC.

My studies add to the understanding of unethical behavior in contests. By elaborating the concept of ego and task SC, I laid out a possible mechanism by which specific attributes of contests promote unethical behavior. This mechanism was partly supported by experimental evidence. Nevertheless, to increase the confidence in this effect, future research must replicate it in laboratory and field studies. With the new scale for ego and task SC, such research questions can now be investigated. The most pressing research in this regard is a successful manipulation of task SC and the according validation of the task SC subscale. This scale could then be used to investigate the role of ego *and* task SC in the effect of various contest attributes on performance and unethical behavior. Lastly, trait and state competitiveness should be defined more clearly, and an improved scale must be developed to consolidate ego and task as well as trait and state competitiveness.

Nevertheless, the present research in its entirety makes an important contribution in conceptualizing state competitiveness for the first time, and by showing that the concept plays a potentially important role in competition behavior. My work is only a first step and I hope that it will be the precursor to following investigations into state competitiveness.

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