Motivational dynamics underlying competition: The opposing processes model of competition and performance

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Abstract

The chapter delineates motivational mechanisms underlying how competition affects performance. The authors propose an opposing processes model of competition and performance in which competition positively influences performance via the adoption of performance-approach goals (i.e., trying to do better than others), whereas competition impairs performance via the adoption of performance-avoidance goals (i.e., trying to avoid doing worse than others). In competitions, these positive and negative goal processes often cancel each other out, producing a seemingly weak or non-existent relationship between competition and performance. The authors review empirical evidence for the proposed model, discuss the implications of the model in relation to other theoretical perspectives on competition, and speculate on the possibility that competition can play an instrumental role in sustainable engagement in a task.

Keywords: competition, achievement motivation, achievement goals, approach-avoidance, performance

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For better or worse, competition strongly drives people's motivation. When we are put in competition, our mental state changes considerably—competition makes our goals specific and explicit (Locke & Latham, 1990), makes incentive structure salient (Garcia et al., 2013), activates explicit social comparison processes (Mussweiler & Epstude, 2009), and evokes self-evaluative concerns (Butler, 1987; Jury et al., 2015); all of these come together to strongly influence our behavior. Given this powerful motivating function, it is not surprising that people are inclined to implement competition as a way to motivate people to obtain better outcomes (Murayama et al., 2016). In fact, the idea that competition is important and valuable to facilitate productive performance seems the default assumption in many contemporary cultures. In a number of theories in psychology competition has been posited to facilitate people's productivity and performance (Abra, 1993; Locke, 1968; McClelland et al., 1976; Swab & Johnson, 2019; Worrell et al., 2016), and there is empirical evidence supporting this idea (e.g., Okebukola, 1984; Scott & Cherrington, 1974; Shalley & Oldham, 1997; van de Pol et al., 2012). Indeed, one of the first experimental studies in social psychology, in which Norman Triplett (1897) examined children's performance on a fishing reel task, showed that children (at least numerically) performed better when in competition with another child.

However, we can also imagine that competition fails to produce optimal outcomes because competition often causes considerable stress and elicits fearful concerns about failure. There are several extant theories that posit competition is harmful and detrimental to task outcomes (Bonta, 1997; Deutsch, 1949; Kohn, 1986; Ulrich, 2008), and empirical evidence also supports the idea showing that competition can impair task performance (e.g., Butler, 1989; Johnson et al. 1979) or at most have little positive effect (e.g., Hinsz, 2005; Johnson et al., 1985).

Here we face a big question. On one hand, competition is unequivocally motivating. On the other hand, competition sometimes facilitates, sometimes impairs, and sometimes has little effect on performance. These propositions seem contradictory. How then can we accommodate these perspectives? We believe the answer lies in the fact that not all motivation facilitates performance and productivity. Decades of studies on human motivation have revealed that motivation is not a unitary concept, and there are a variety of motivational processes that influence learning, decision making, and performance in different ways (Elliot et al., 2017). Competition is clearly motivating for people and influences the way they perform, but this does not necessarily mean that competition always facilitates performance.

To understand the motivational dynamics underlying competition, we focus on two motivational processes particularly relevant in the context of competition—performance-approach goal and performance-avoidance goal pursuit as studied in the achievement goal literature. In the following, we first review the literature on these goals, and then describe an opposing processes model of competition and performance (Murayama & Elliot, 2012a) that provides a motivational account of the psychological processes underlying competition. We then discuss how this model can accommodate and integrate different theoretical perspectives on competition, followed by a discussion on future agenda items to advance the field.

Performance-approach and Performance-avoidance Achievement Goals

An achievement goal is conceptualized as a cognitive representation of a desired end state for people's competence-relevant engagement (Dweck & Leggett, 1988; Elliot, 1999; Nicholls, 1989). In achievement or competence-relevant situations, people adopt a variety of different idiographic goals but studies on achievement motivation have identified a

few distinct types of goals that have different consequences for the self-regulation process. The first types of achievement goals identified in the literature were mastery goals (also called learning goals) and performance goals (also called ego goals; Ames, 1992; Dweck, 1986; Nicholls, 1984). A mastery goal may be defined as the goal to gain personal competence, as defined by absolute/intrapersonal standards, which often come with the motivation to achieve personal development and task mastery. On the other hand, a performance goal may be defined as the goal to gain personal competence as defined by normative or comparative standards—i.e., the goal to perform well in comparison to other people. Empirical investigation of achievement goals based on this dichotomous mastery-performance model dominated the literature from the 1980s through the mid-to-late 1990s.

It is easy to imagine that people are likely to adopt performance goals in a competitive situation, evaluating their own competence in terms of how good they are in comparison to other competitors. In fact, putting participants in a competition was a common way to experimentally manipulate performance goals in the early achievement goal literature (e.g., Ames, 1984). Interestingly, however, despite the seemingly close conceptual link between competition and achievement goals, these two literatures did not have the type of close communication or cross-fertilization with each other that one might expect. In fact, achievement goal researchers in this early period focused mainly on mastery goals, which were repeatedly shown to be associated with a host of positive outcomes such as self-efficacy and task enjoyment (Miller et al., 1996; Pintrich & DeGroot, 1990). Nevertheless, the empirical findings on performance goals at the time exhibited an interesting parallel with the empirical findings observed in the literature on competition. Specifically, much like empirical work on competition and downstream outcomes, achievement goal researchers found either positive, negative, or negligible relationships of performance goals with a variety of different outcomes (Elliot, 1999; Elliot & Church, 1997): Some studies showed that performance goals are associated with positive outcomes such as self-efficacy and task performance (e.g., Meece et al., 1988; Pintrich & Garcia, 1991), while others observed detrimental effects of performance goals on these variables (e.g., Graham & Golan, 1991; see also Ames, 1992 for a review). There are also many other studies showing that performance goals are not reliably associated with achievement-relevant outcomes (e.g., Miller et al., 1993; Nolen & Haladyna, 1990).

To address the seemingly contradictory findings, Elliot and colleagues proposed to bifurcate performance goals into two different types (e.g., Elliot & Church, 1997; Elliot & Harackiewicz, 1996): performance-approach goals and performance-avoidance goals. A performance-approach goal may be defined as the goal to achieve high competence in comparison to other people (i.e., “My goal is to do better than others”), whereas a performance-avoidance goal is the goal to avoid incompetence in comparison to other people (i.e., “My goal is to avoid doing worse than others”). This distinction was theoretically grounded in the long-standing distinction between approach and avoidance motivation, which has been proposed and investigated (often using different names) in different forms across a variety of different disciplines (Elliot & Covington, 2001). Examples include psychological need (need for achievement and fear of failure; Atkinson, 1957), goal gradients (approach vs. avoidance gradients; Miller, 1944), attachment styles (secure vs. insecure; Bowlby, 1969), temperaments (behavioral activation vs. behavioral inhibition; Gray, 1987), message framing (positive vs. negative framing; Tversky & Kahneman, 1981), and regulatory focus (promotion focus vs. prevention focus; Higgins, 1997).

Elliot and colleagues argued that the distinction between performance-approach and performance-avoidance goals was important to

resolving the apparent inconsistency in empirical findings for performance goals (Elliot, 1999; Elliot & Thrash, 2001). They indicated that performance-approach goals are rooted in appetitive motivation to approach desirable outcomes, and direct us to focus on achieving a high standard of excellence, whereas performance-avoidance goals are rooted in aversive motivation to avoid feared outcomes, and direct our attention to the possibility of losing and its implications. As such, performance-approach goals were posited to be associated with more adaptive outcomes than performance-avoidance goals. Empirical research has supported these ideas. For example, many studies have shown that items assessing performance-approach goals (e.g., "My aim is to perform well relative to other students") are positive predictors of task performance (e.g., exam performance), whereas items assessing performance-avoidance goals (e.g., "My aim is to avoid doing worse than other students") negatively predict the same performance outcomes (Elliot & Church, 1997; Elliot & Murayama, 2008; Harackiewicz et al., 2002; for meta-analyses see Hulleman et al., 2010; Van Yperen et al., 2014). This is the case despite the fact that measures of these goals share considerable semantic similarity (i.e., only the contextual framing is different; see Tversky & Kahneman, 1981). In short, the bifurcation of performance-approach and performance-avoidance goals considerably clarified the relationship between achievement goals and achievement-relevant outcomes.

The Opposing Processes Model of Competition and Performance

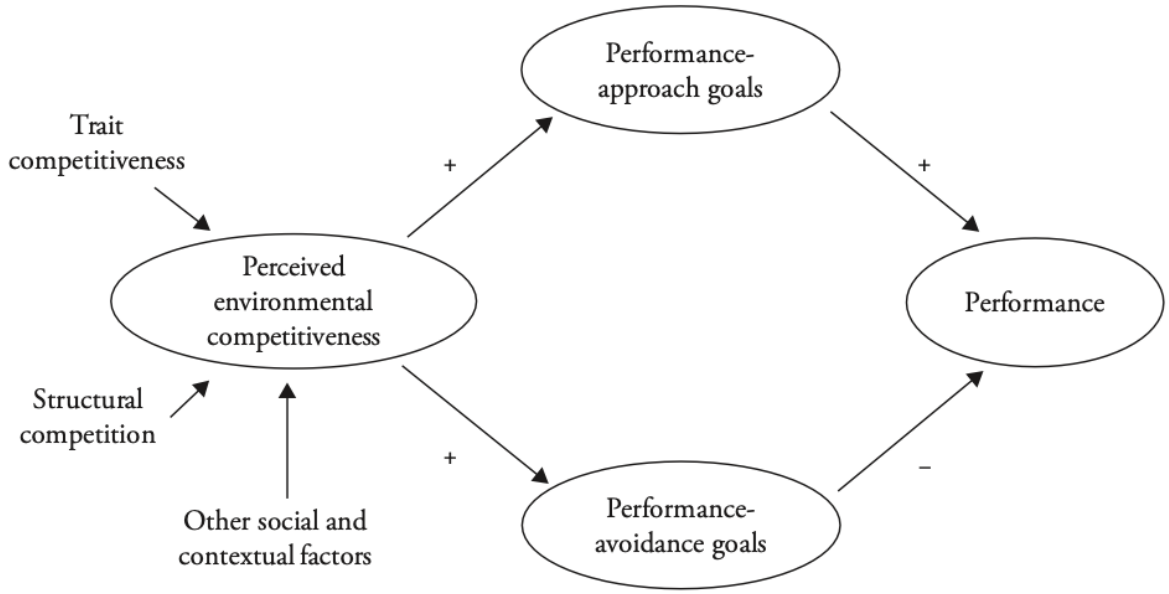
The distinction between performance-approach goals and performance-avoidance goals provides theoretical insight into the motivational dynamics underlying competition. More specifically, the inconsistent findings on the relationship between competition and performance can be seen as a result of the divergent, opposing effects of performance-approach goals and performance-avoidance goals on downstream outcomes in competition contexts. Murayama and Elliot (2012a) devised a conceptual model of these competition and acheivement goal processes that they labeled the opposing processes model of competition and performance (see Figure 1).

The starting point of the model is competition, be it trait competitiveness, perceived environmental competitiveness, or structural competition. People's perceived environmental competitiveness is the most proximal predictor of the two performance-based goals in the model. Note that perceived environmental competitiveness is not merely the reflection of the objective reward structure in the situation. When people are put in a competitive reward structure (which we often call "structural competition," i.e., outcomes are evaluated in comparison to another competitor or competitors, not an absolute criterion), they are likely to perceive the situation as competitive. However, the extent to which people perceive the presence of competitiveness depends on other situational and social cues (e.g., how the competition is framed, the nature of the task, one's relationship with competitors, etc.) and people's personality traits. The most relevant personality trait in this context is trait competitiveness, which represents a dispositional and stable preference to compete with others in achievement situations (Spence & Helmreich, 1983). Research has suggested that those with high trait competitiveness tend to perceive others and environments as more competitive (Aksoy & Weesie, 2012; Fletcher & Nusbaum, 2010; Schrock et al., 2016). For example, Elliot, Jury, and Murayama (2018) showed that trait competitiveness is a positive predictor of perceived environmental competitiveness, both in academic and job contexts, a phenomenon they labelled "competitiveness projection."

Once people (subjectively) recognize that they are in a competitive environment, social comparison process becomes salient, and they come to evaluate their own competence based on a normative standard.

Figure 1

A schematic picture of the opposing processes model of competition and performance. Competition is only weakly related to performance, but this is due to the positive indirect effect of performance-approach goals and the negative indirect effect of performance-avoidance goals.



This use of an evaluative standard of competence leads them to adopt performance goals, more specifically, performance-approach and performance-avoidance goals. Importantly, these two goals have opposite consequences as noted earlier—performance-approach goals tend to facilitate task performance, whereas performance-avoidance goals tend to impair performance. These facilitating and debilitating goal processes are often of comparable magnitude and, as a consequence, the effects of the two performance-based goals commonly cancel each other out, producing an overall weak or non-existent relationship between competition and performance. Conceptually, this means that competition puts people in a type of motivational conflict regarding approach and avoidance goals. On the upside, competition strengthens people's appetitive strivings for desirable outcomes through performance-approach goals, increasing the likelihood of obtaining optimal outcomes. On the downside, however, competition increases people's performance anxiety and concerns about failure through performance-avoidance goals, preventing people from achieving optimal performance. The idea of approach-avoidance conflict has a long history in the literature on achievement motivation (e.g., Atkinson, 1957; Lewin et al., 1944) and competition can be considered a natural setting that strongly elicits such motivational conflicts.

Statistically speaking, the opposing processes model posits a version of inconsistent mediation that explains the link between competition and performance. Inconsistent mediation occurs when there is a weak (often non-significant) relationship between the independent variable and the dependent variable, which can be explained by indirect and direct effects that have different signs (MacKinnon et al. 2000; Shrout & Bolger, 2002). In the proposed model (Figure 1), there is a positive indirect effect through performance-approach goals and a negative indirect effect through performance-avoidance

goals, both of which combine to produce a relatively weak or negligible total effect between competition and performance. One important implication of this inconsistent mediation is that a weak overall relationship (i.e., weak total effect) signals the possibility of conflicting motivational processes rather than the absence of any interesting relationship. From a traditional perspective of research practice, researchers are likely to be discouraged when observing a non-significant effect or inconclusive findings, and we can easily imagine that this has been the case for many researchers who have examined the link between competition and performance in the past. The opposing processes model dramatically changes this traditional way of thinking. Indeed, a weak/negligible overall relationship is the key to deeply understanding the motivational dynamics underlying the relationship between competitive and performance.

Empirical Support

The opposing processes model of competition and performance is based on a few presuppositions. First, when performance-approach and performance-avoidance goals are not included in statistical modelling, competition and performance are at most only weakly related, due to the mutual cancelling effects of these two (hidden) motivational variables. Second, competition enhances both performance-approach and performance-avoidance goals. Third, performance-approach goals positively predict performance, whereas performance-avoidance goals negatively predict performance.

To test the first presupposition, Murayama and Elliot (2012a) conducted a meta-analysis that examined the relationship between competition and performance in the extant literature. The meta-analysis distinguished between three different types of studies: (1) studies that assessed trait competitiveness as an individual difference, (2) studies that assessed perceived environmental competitiveness, and (3) studies that manipulated competition (i.e., "structural competition") in an experimental setting. The results were sobering (at least for theorists in either the pro-competition or anti-competition camps), but consistent with the opposing processes model. Specifically, the correlation coefficient between trait competitiveness and performance (65 studies, total N = 14,721) was very small, r =.05, 95% CI [0.02, 0.08]; the correlation between perceived environmental competitiveness and performance (33 studies, total N = 11,439) was negligible, r = -.01, 95% CI [-0.06, 0.04]; the effects of structural competition on performance was also negligible, Hedge's g = 0.04, 95% CI [-0.08, 0.16]. In addition, we combined these three types of effect sizes and the integrated effect size was again negligible, r = .03, 95% CI [-0.00, 0.06]. Therefore, we can conclude that the overall relationship between competition and performance is weak-to-non-existent, leaving open the possibility that it is mediated by divergent, conflicting psychological processes.

Murayama and Elliot (2012a) also conducted a further meta-analysis to test the second and the third presuppositions. More specifically they collected previous studies that assessed at least two of the following key variables in the model: competition, performance-approach goals, performance-avoidance goals, and task performance. For the relationship between competition and performance, they had already conducted a meta-analysis to obtain the correlation. In the same fashion, they meta-analyzed the correlations of all pairs of variables and created a "meta-correlation matrix" of these four variables of interest. This meta-correlation matrix provided strong support for the opposing processes model. Specifically, competition was strongly correlated with performance-approach goals, r = .41, 95% CI [.36, .46] and performance-avoidance goals, r = .30, 95% CI [.25, .35], suggesting that competition is likely co-activate both of these goals (although it is important to acknowledge that the relationships

are correlational). Performance-approach goals positively predicted task performance, r = .10, 95% CI [.08, .12], whereas performance-avoidance goals were a negative predictor, r = -.12, 95% CI [-.14, -.10]. To provide a more complete test of the full model, they also conducted meta-analytic structural equation modelling with the obtained meta-correlation matrix (Cheung & Chan, 2005). The results were consistent with those observed in the meta-correlation matrix—while competition was positively associated with performance-approach and performance-avoidance goals, standardized b = 0.41 and .29, p < .01, respectively, performance was positively predicted by performance-approach goals, standardized b = 0.15, p < .01 and negatively predicted by performance-avoidance goals, standardized b = -0.17, p < .01. Importantly, the model showed a good fit to the data, χ^2 (1) = 1.03, p = .31, suggesting that the weak/non-existent relationship between competition and performance is well explained by the inconsistent mediation effects of performance-approach and performance-avoidance goals.

To further test the proposed model, Murayama and Elliot (2012a) also conducted two new prospective survey studies in a university psychology class (focusing on trait competitiveness and perceived environmental competitiveness) and a new lab experiment. Each of these new studies also provided strong support for the opposing processes model. For example, in one survey study, students' trait competitiveness positively and significantly predicted the adoption of performance-approach and performance-avoidance goals for the class (assessed three weeks later), which in turn predicted exam performance at the end of the class (in opposite directions)—performance-approach goals positively predicted exam performance, whereas performance-avoidance goals negatively predicted it (for a replication of these indirect effects, see Elliot et al., 2018). Finally, in a lab experiment, participants worked in pairs on an anagram task. Half of the participants were instructed that they would do the task in competition with the other participant (competition group), whereas the other half of the participants were simply informed that they would do the task individually (control group). Participants in the competition group showed higher performance-approach goals and performance-avoidance goals in comparison to those in the control group, suggesting that competition made participants adopt performance-approach and performance-avoidance goals at the same time. Importantly, the competition manipulation did not have a statistically significant effect on performance, but performance-approach and performance-avoidance goals predicted task performance in opposite directions (i.e., performance-approach goals was a positive predictor, whereas performance-avoidance goals were a negative predictor), supporting the opposing processes model.

Subsequent research has put the opposing processes model to test in other ways. For example, Hangen et al. (2016) showed that the model can be extended from performance-based goals to challenge and threat physiology, and from performance outcomes to risk-taking outcomes. Sommet et al. (2019) demonstrated that the model can be applied to the issue of income inequality in real-world economic environments; specifically, local income inequality positively predicted perceptions of local competitiveness which, in turn, positively predicted economic performance-approach and performance-avoidance goals. Elliot, Weissman et al. (2021) documented that initial social comparison information about an opponent (whether one is competing against a strong or weak opponent), and associated performance expectancies, are important variables predicting performance-approach (but, contrary to predictions, not performance-avoidance) goal pursuit in competition contexts; specifically, downward comparison predicted positive performance expectancies which, in turn, positively predicted performance-approach goals. These studies illustrate the

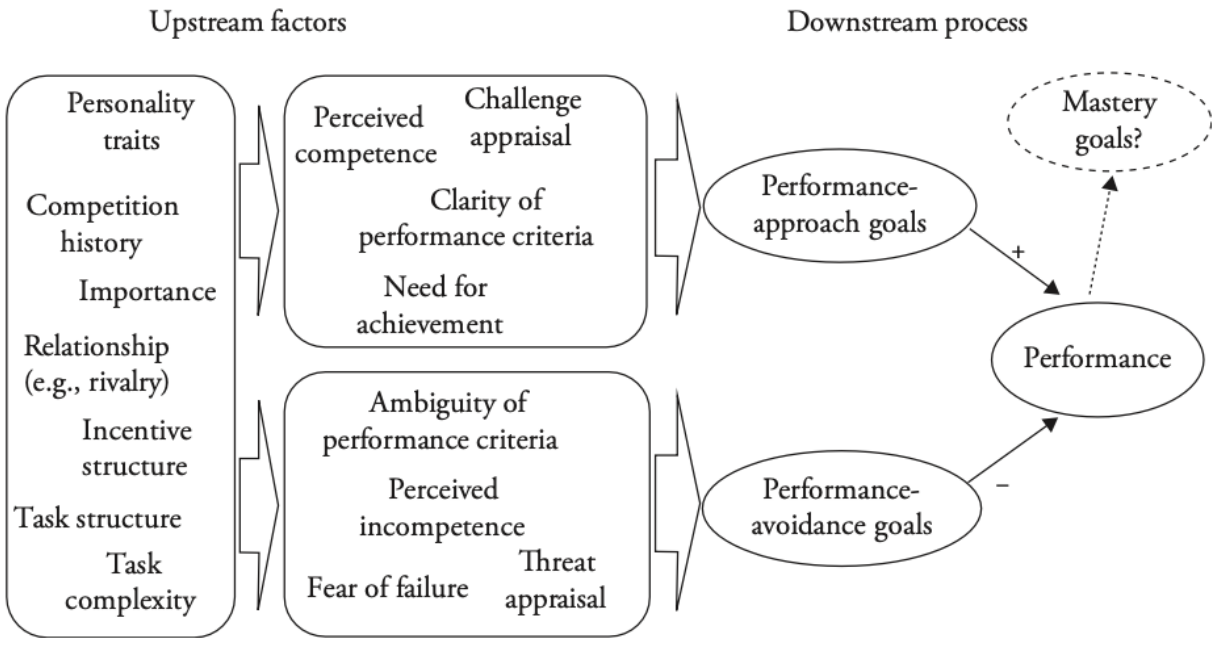
broad applicability and potential generativity of the opposing processes model (see also Elliot, 2020).

Theories of Competition through the Lens of the Opposing Processes Model of Competition and Performance

We are not the first theorists to contend that competition has both positive and negative effects. Close scrutiny of past theorizing on competition and related phenomena reveals a number of nuanced perspectives on how competition could have positive or negative influences on task performance, identifying a number of critical factors that could make competition adaptive or maladaptive. Importantly, our proposed model on competition is not meant to compete with these theoretical perspectives—rather, most of the proposed factors can be seen as affecting the competition–performance relationship by selectively influencing the adoption of performance-approach goals or performance-avoidance goals. That is, the existing theories on competition and related phenomena mostly focus on upstream factors operative in competitive situations, that we think eventuate in the adoption of performance-approach and performance-avoidance goals downstream (see Figure 2). In this respect, the proposed model and the existing theories of competition may be seen as complementary, providing a more comprehensive picture of the competition–performance relationship as a whole. To illustrate, we will overview some existing theoretical perspectives on competition and related phenomena, and explain how they are related to the proposed opposing processes model.

Figure 2

Performance-approach and performance-avoidance goals as downstream processes of competition –> performance relations.



Social Interdependence Theory

Social independence theory (Deutsch, 1949; Johnson & Johnson, 1989) addresses how the structure of relations among individuals influences outcomes. The interdependence structure includes cooperative (positive interdependence), competitive (negative interdependence), and individualistic (no interdependence) relations. The theory primarily emphasizes the positive effects of cooperative situations on a number of psychological and performance outcomes (for meta-analyses, see Johnson et al., 2014; Johnson et al., 1981; Roseth et al., 2008). Competitive situations, on the other hand, are basically viewed as maladaptive because they create negative interpersonal emotions which are presumed to hamper task performance and learning processes (Johnson & Johnson, 1989). At the same time, researchers in this area (Johnson & Johnson, 1975/1999, 1978; Stanne et al., 1999) have also noted the possibility that competition can be appropriate and productive ("constructive competition"). The conditions for constructive competition include: (1) when winning is relatively unimportant; (2) when all participants have a reasonable chance of winning; (3) when the rules, procedures, and criteria for winning are clear and specific; and (4) when participants are able to monitor each other's progress and engage in social comparison (Johnson et al., 2012).

Importantly, several of the conditions described above create situations in which performance-approach goals are likely to emerge and performance-avoidance goals are likely to be less prominent; as such, our model can explain why these conditions are likely to produce adaptive outcomes in competition. For example, high-stakes situations heighten perceived performance pressure, likely producing distracting concerns and worries about one's competence. These concerns and worries are the source of the adoption of performance-avoidance goals (Brodish & Devine, 2009; Jury et al., 2019; see also Crouzevialle & Butera, 2017 for an alternative perspective). On the other hand, situations designed to downplay the importance of winning would likely facilitate the adoption of performance-approach goals; thus such situations would bring adaptive outcomes. In addition, ensuring that everyone can win is likely to increase the perceived competence of participants. Because perceived competence is a critical source of the adoption of performance-approach goals (Kumar & Jagacinski, 2011; Senko & Harackiewicz, 2005), such situations are likely to result in improved performance. Finally, because past work has shown that ambiguity regarding one's level of performance makes performance-approach goals less effective (Darnon et al., 2007), providing clear and specific performance criteria should facilitate the adoption of performance-approach goals over performance-avoidance goals. Therefore, clear and specific performance criteria are likely to produce enhanced task performance. Overall, these observations suggest that performance-approach and performance-avoidance goals can be proximal mediators through which constructive competition can produce positive outcomes (Murayama & Elliot, 2012b).

Social Facilitation and Inhibition

Since the seminal work by Triplett (1897), social psychologists have shown that the mere presence of others can facilitate task performance, a phenomenon called social facilitation (Aiello & Douthitt, 2001; Guerin, 1993). Interestingly, this line of research has also shown that the presence of others can impair task performance under certain conditions, which is called social inhibition. Although this literature does not directly focus on competition, it is reasonable to assume that the mere presence of others triggers social comparison processes, which is the basis of psychological mechanisms underlying

competition (Garcia et al., 2013). Importantly, from the standpoint of the opposing processes model, we can hypothesize that social facilitation occurs when performance-approach goals are dominant, whereas social inhibition occurs when performance-avoidance goals are dominant. In fact, previous studies have identified moderators of the social facilitation effect, and these factors seem to fit well with the opposing processes model of competition and performance. For example, one crucial moderator that has been identified is task complexity. Specifically, the social facilitation effect is observed when the task is simple, whereas task performance is impaired when the task is complex (Bond & Titus, 1983). Simple tasks have clear performance criteria, which is likely to enhance the adoption of performance-approach goals, as discussed above. In addition, for simple tasks, the development of task skill is a more visible and readily perceived process, and people may be able to develop a stronger sense of competence accordingly relative to complex tasks; this too is a critical predictor of performance-approach goals.

Another moderator that has been identified in the literature is personality traits. Specifically, in a meta-analysis Uziel (2007) found that those who have a so-called "positive orientation" personality trait, which includes extraversion and high self-esteem, tend to show the social facilitation effect. On the other hand, those who have a "negative orientation" personality trait, which includes trait anxiety and low self-esteem, tend to show the social inhibition effect. These effects were statistically independent of the effects of task complexity. Previous studies in the achievement goal literature showed that such positive and negative orientation personality traits are related to performance-approach and performance-avoidance goals, respectively (Elliot & Thrash, 2002). As such, the moderation by positive/negative personality traits can be easily interpreted in accord with the opposing processes model: Those who possess positive orientation personality traits tend to adopt performance-approach goals in the presence of others, which produces a social facilitation effect, while those who have negative orientation personality traits tend to adopt performance-avoidance goals in the presence of others, resulting in a social inhibition effect.

Challenge and Threat

Competitive contexts elicit two different types of stress responses—challenge and threat. According to the biopsychosocial model of challenge and threat (Blascovich & Mendes, 2000), an achievement situation such as competition prompts people to evaluate resource availability and task demands. When people appraise resources as abundant and task demands as low, a state of challenge arises, which is associated with activation of the sympathetic-adrenomedullary (SAM) axis. When people appraise resources as scarce and task demand as high, a state of threat arises, which is associated with activation of the SAM and hypothalamic-pituitary-adrenal axes (Seery, 2013). Critically, challenge tends to be associated with better performance than threat (e.g., Chalabaev et al., 2009; Turner et al., 2012).

Although the research on challenge and threat is not primarily proposed to address competition settings, it provides insight into when competition is adaptive and when it is not. More specifically, the model indicates that competitive situations can either facilitate or impair task performance, depending on whether the situation evokes challenge or threat. As alluded to earlier, Hangen et al. (2016) have shown that in a competitive context individuals differ in their profile of physiological responses to the situation; some exhibit a challenge-related pattern (e.g., elevated cardiac output), whereas others exhibit a threat-related pattern (e.g., decreased cardiac output). They further showed that participants with a challenge pattern of physiological reactivity engaged in more risk-seeking behaviour than those who showed a threat pattern of reactivity. From the perspective of the opposing processes model of

competition and performance, challenge and threat can be considered as closely tied to the adoption of performance-approach and performance-avoidance goals, respectively. Performance-approach goals and performance-avoidance goals may be a mediator of the relationship between challenge/threat appraisals and task performance (see McGregor & Elliot, 2002), and/or challenge/threat appraisals may mediate the relationship between the two performance goals and performance (see Chalabaev et al., 2009); that is, the links between these goal and appraisal constructs may be reciprocal in nature. Further integration of these goal and appraisal literatures seems destined to shed further light on the role of appetitive and aversive processes in competition contexts.

Rivalry

Research on rivalry (see Converse, Reinhard, & Austin, this volume) has found that the presence of a rival (i.e., an opponent with similar ability against whom the focal person has a long history of competing) results in enhanced motivation and performance (Kilduff, 2014; Pike et al., 2018). This effect of rivalry should be primarily driven by the relationship history with the rival, but at the same time it is possible that the presence of a rival could facilitate the adoption of performance-approach goals that enhance performance. For example, having a rival should increase the clarity of one's goals (i.e., clearer performance criteria), which is a factor that is related to the adoption of performance-approach goals (Darnon et al., 2007). In addition, because rivals are likely to perform at a similar level as the focal person, rivalry brings moderate (optimal) challenge which should facilitate achievement motivation in general (McClelland et al., 1976) and performance-approach goals in particular (Elliot & Murayama, 2008). In fact, a recent study has shown that rivalry is positively related to the adoption of performance-approach goals (Kilduff et al., 2016).

Choking Under Pressure

When placed in a high-stakes situation, people often feel considerable anxiety and pressure that interferes with optimal performance. Baumeister and Showers (1986) described such a phenomenon as "choking under pressure," and argued that competition is one of the prominent situations that causes choking. Since their seminal paper, a number of studies have examined the psychological mechanisms operative in choking under pressure (e.g., Beilock & Carr, 2001; Gimmig et al., 2006; Gucciardi & Dimmock, 2008).

Importantly, Baumeister and Showers (1986) noted that people are more likely to suffer from choking when (1) the task is complex, (2) people's perceived competence is low, and (3) people possess anxiety-related personality traits. As can be readily seen, these are the exact factors that we have already discussed as promoting the adoption of performance-avoidance goals as opposed to performance-approach goals. Thus, we think it likely that choking under pressure impairs task performance through the adoption of performance-avoidance goals (but see also Smeding et al., 2015). In fact, previous research has found that reappraisal in competitive contexts reduces threat responses (which are closely related to performance-avoidance goals, as discussed above) and prevents choking under pressure (Lee et al., 2015).

Further Ahead: Competition as the Basis for Autonomous Engagement?

As shown in the previous literature review, we believe that the proposed opposing processes model can be straightforwardly integrated with other existing theories focusing on how competition influences performance. The different theoretical perspectives may be seen as complementary parts of a more complete and full model—performance-approach and performance-avoidance goals may primarily be seen as downstream mediators that pull together a number of factors identified as important in the literature (see Figure 2). At the same time, however, there is

other literature indicating the possibility that competition influences performance through a slightly different route than performance-based goals.

This possibility is especially noticeable in the literature on trait competitiveness. As indicated earlier, trait competitiveness represents one's enduring preference for competitive situations. Traditional theoretical perspectives on trait competitiveness consider it a unidimensional construct (e.g., Spence & Helmreich, 1983) and we followed that convention when introducing the opposing processes model. However, several theorists have proposed different subtypes of trait competitiveness. Among them, Ryckman et al. (1997) drew a distinction between hypercompetitive attitude and personal-development competitive attitude. Hypercompetitive attitude refers to a strong urge to engage in competition in order to win (or to avoid losing) at any cost as a means of maintaining feelings of self-worth. On the other hand, personal-development competitive attitude refers to a person's tendency to focus on using the competitive experience to facilitate personal growth and development, instead of winning the competition (Ryckman et al., 1997). Hypercompetitiveness is similar to traditional trait competitiveness (in fact, the meta-analysis we discussed earlier coded hypercompetitiveness as trait competitiveness), but the personal-development competitive attitude has the remarkable characteristic that it focuses on intrapersonal development rather than interpersonal comparison. Previous studies have shown that personal-development competitive attitude is positively related to positive psychological functioning (Ryckman et al., 1996). Orosz et al. (2018) developed a multidimensional scale of competition that included a highly similar construct (namely "self-developmental competitive orientation").

This focus on personal growth has also been attended to in the literature on envy (see Montal-Rosenberg & Moran, this volume). Envy is an affective state that occurs in response to upward comparison (i.e., social comparison with superior others). Upward comparison signals relative inferiority and incompetence, which is likely to prompt people to adopt performance-avoidance goals. In line with this idea, research on envy typically shows that envy is related to negative consequences (Vecchio, 2000). However, recent studies have distinguished two different types of envy that can emerge in a competitive context—malicious envy and benign envy (van de Ven, 2016). Malicious envy is what traditional research on envy has focused on; it elicits negative behavior and results in maladaptive consequences. On the other hand, benign envy is defined as envy that leads to motivation for self-improvement and development, and empirical work has shown that benign envy is associated with positive performance outcomes (e.g., van de Ven et al., 2011). This work on benign envy suggests that people can focus on self-development and growth even in competitive situations.

These lines of work suggest the interesting possibility that people may adopt mastery goals as well as performance-approach and performance-avoidance goals in competitive contexts. As indicated earlier, a mastery goal is a goal by which people evaluate their competence against an intraindividual or task-based standard, which is typically associated with the motivation for personal development and task mastery. As such, traditional work on achievement goals has assumed that mastery goals have little or nothing to do with competitive situations. However, this view has been challenged by several researchers. For example, Butler (1989; 1992) showed that people often use normative standards for the purpose of self-improvement in contexts where mastery goals are encouraged. Régner et al., (2007) showed that mastery goals, as well as performance-approach and performance-avoidance goals, are positively related to social comparison orientation in high-school students (see also Bounoua et al., 2012). In the same vein, Darnon

and colleagues (2010) showed that mastery goals are positively related to social comparison orientation in the same contexts that elicits performance-approach goals. Finally, Jury et al.(2015) demonstrated that in competitive contexts in which both social comparison and temporal comparison are salient, individuals can either endorse mastery goals or performance-based goals. These observations are consistent with the literature on social comparison arguing that social comparison information is useful for self-assessment and self-improvement (Festinger et al., 1950; Taylor & Lobel, 1989).

We still believe that the adoption of performance-approach and/or performance-avoidance goals is the default reaction of people when they are placed in a competitive context, but it is possible that some people adopt mastery goals to overcome the motivational conflict between performance-approach and performance-avoidance goals. This possibility provides a new look at the motivational process underlying competition (see Ryan & Reeve, this volume). Mastery goals are typically only weakly (but positively) related to task performance but are strongly associated with a host of positive psychological experiences such as enjoyment and intrinsic motivation (e.g., Elliot & Church, 1997; Pekrun et al., 2009; for a meta-analysis, see Hulleman et al., 2010). Such positive subjective experiences are the source of long-term engagement and task interest (Deci & Ryan, 1985; Renninger & Hidi, 2016). As such, the adoption of mastery goals during competition may support long-term engagement in the task.

Typically, competitive engagement is short-lived. This is because the rewarding outcome is no longer available once the competition is over: When the winner is announced, unless there is a next game, there is no longer an obvious incentive to continue to engage with the task or activity. However, mastery goals that are adopted during a competition may provide a basis for long-term engagement in a task that lasts beyond the competitive context; mastery goals can create an internal performance criterion against which people continue to strive without any explicit normative outcome or feedback. A similar idea is also suggested by the reward-learning framework of knowledge acquisition (Murayama, 2019; Murayama et al., 2019). According to this framework, regardless of the type of motivation or goals, people's engagement is supported by a common reward-learning process. Importantly, people have the capacity to generate internal rewards (e.g., a feeling of enjoyment) to sustain task engagement without any extrinsic incentives, but incentives or motivation plays an instrumental role for this autonomous process to be "started-up." Competition can be one such instrumental factor, and from this perspective, we can delineate a potential developmental trajectory for motivation in competitive situations. Specifically, competition strongly motivates people to acquire a competitive incentive via the adoption of performance-approach and performance-avoidance goals. When performance-approach goals become dominant (due to the factors we identified earlier), people are more likely to obtain successful outcomes, through which they develop the feeling of competence (initially defined in normative terms). Such a feeling of competence forms the basis of the internal generation of rewards for self-improvement and task mastery, which facilitate the adoption of mastery goals. The resultant internal self-rewarding process then supports continuing engagement in the task. In other words, even if one is initially forced to participate in a competitive situation, it is possible that the person develops their own interest and autonomous engagement over time through successful outcomes. This is still an underexamined topic which is worthy of more research attention.

Final Thoughts

One striking observation from our conceptual and empirical overview is that, despite the enormous number of studies

examining the competition–performance relationship, the majority of research has not paid attention to the psychological process underlying the effect. In many studies, researchers have simply examined the relationship between competition (assessed or manipulated) and performance, and simply described the relationship without providing detailed empirical evidence of why such relations were observed. This is unfortunate; as noted earlier, the lack of a process perspective makes interpretation of the null effect very difficult, and researchers may even abandon exploration of such relationships despite the fact that the null results may be a consequence of interesting motivational dynamics. Even if researchers find some effects of competition, either positive or negative, without knowing the psychological process, it would be difficult for them to explain why the obtained results were different from other, earlier studies. In the meta-analysis that we conducted (Murayama & Elliot, 2012a), although the overall effect of competition on performance was very small (to non-existent), the observed effect sizes varied substantially between studies, indicating that there are some cases when competition was positively related to task performance and other cases when it was negatively related. We believe that the relative dominance of performance-approach and performance-avoidance goals in a situation can explain the heterogeneity of effect size, but we were unable to test this hypothesis because few of these studies measured/manipulated any process-related variables. Future research should examine the competition-performance relationship in a more fine-grained manner, focusing more on psychological processes than outcomes.

Another noteworthy observation from the existing literature is that, in experimental studies in particular, competition has been mainly studied with regard to short, one-off tasks, and the long-term implications of competitive situations have not been well-studied. As we suggested toward the end of our chapter, to understand the function of competition in everyday, real life settings, it is essential to shed more light on the longer-term developmental trajectories of competitive motivation. That is, to better understand the competitive motivation of professional tennis players, for example, we need to scrutinize their personal histories of competition with other players. Our proposed model is useful in understanding the short-term dynamics of the competition–performance relationship, but future studies would do well to take a longitudinal and developmental perspective in order to examine the generalizability of the proposed model and, possibly, to extend it beyond its current form.

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