

# State of the Art in Competition Research

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## Abstract

Until the 1990s in psychology, competition was conceived as a unidimensional concept which is opposed to cooperation. Since then, the competition–cooperation dichotomy has shifted and competition is conceptualized as a multifaceted concept that is not in mutually exclusive relationship with cooperation. Constructive and destructive forms of competition have been distinguished regarding their motivational, strategic, and behavioral consequences. Personality psychologists identified different competitive attitudes and research on the psychology of winning and losing, and differentiated specific patterns of emotional and behavioral coping with winning and losing. More recently, psychophysiological, genetic, and neuroimaging studies enrich the understanding of competition. The warrior and worrier genes, the psychology and physiology of challenge and threat, and the neurohormonal changes open up new dimensions of interpretation of competitive encounters and winning and losing. The new challenge of the field is the integration of the accumulated knowledge in a new bio-psycho-socio-cultural model of competition.

## INTRODUCTION

Competition is an interdisciplinary concept; it is used in evolutionary biology, anthropology, sociology, economics, sport sciences, psychology, educational sciences, management, political science, and so on (Fülöp, 2004). Competition is present in many arenas of human life, in all groups that have dominance hierarchies, for instance, in the family, school and work settings, in the academia, leisure activities, play groups and peer groups, in friendships, romantic relationships, in civic organizations, political and economic life, in intergroup and interethnic relationships as well as in international relationships. In psychological and educational sciences, competition has been a debated and controversial phenomenon. This chapter focuses on the concept of competition and its changes in the field of psychology and the numerous still open issues related to the research of interpersonal competition.

## FOUNDATIONAL RESEARCH

## COMPETITION IN SYMBIOSIS AND DICHOTOMY WITH COOPERATION: THE “BEAUTY AND THE BEAST” PARADIGM

Competition as one main form of social interaction—maybe almost without other example in the history of psychology—was for more than four decades symbiotically handled with cooperation in social and educational psychology. Since Morton Deutsch’s seminal research on competitive and cooperative goal structures (Deutsch, 1949), these forms of social interaction were conceptualized as two extremes of a single behavioral dimension or polar opposites (Chen, 2008; Fülöp, 2004; Van de Vliert, 1999). Competition was characterized by negative interdependence, that is, one side attaining its goal *decreases* the probability of the other side successfully attaining it and cooperation by positive interdependence, that is, one side attaining its goal is *increased* by the probability of the other side successfully attaining it. Related to the tendency to dichotomize competition and cooperation, there was the assumption in most of the literature of psychology that cooperation is all beneficial; however, competition is an inherently detrimental force that should be eliminated as much as possible from the environments in which children and adolescents grow and also from adult social life (Johnson & Johnson, 1991; Kohn, 1986). This has established what Fülöp (2008) called the *Beauty and Beast* paradigm. Cooperation was meant to lead to effective communication, trust, friendliness and helpfulness, no obstruction of the other’s ideas, coordination of effort, division of labor, mutual enhancement and high productivity. Cooperative goal structures were believed to facilitate learning, lead to greater group productivity, more favorable interpersonal relations, better psychological health, and higher self-esteem. In contrast, competition was seen as a factor that decreases creativity, leads to production loss, destroys relationships, is opposite to pro-social behaviors (Deutsch, 1949; Johnson & Johnson, 1991). Because the goals of the competitors were conceptualized as mutually exclusive, their relationship was characterized by distrust, aggression, manipulation, exploitation, and strong negative emotions. In addition, competition was supposed to cause distress, anxiety, energy loss, exhaustion, loss of motivation, depression and cardiovascular diseases (e.g., Thornton, Ryckman, & Gold, 2011).

## COMPETITION AS A UNIDIMENSIONAL CONCEPT

The symbiotic handling of competition with cooperation has caused serious theoretical and conceptual disadvantages and prevented the multifaceted understanding of competition. Before the paradigm change, psychologists and educationalists for the most part focused on cooperation and studied

competition only in relation to cooperation in order to identify those variables that govern an individual's choice to compete or to cooperate. This has caused some serious theoretical disadvantages because the multidimensional nature of competition eluded researchers as qualitatively different processes and patterns got lumped together within a single and one-dimensional construct of competition (Schneider, Benenson, Fülöp, Berkics, & Sándor, 2010).

#### BEYOND DICHOTOMIES

Because competition and cooperation had been conceptualized as mutually exclusive, it was implied that only one of the two can operate at a given time or in a given context. This presumption has masked their complex interrelationships and prevented researchers from fully exploring them and left unrevealed the richness of competition–cooperation interplays (Schneider *et al.*, 2010).

From the beginning of the 1990s, however, there has been a paradigm change toward a less dichotomic concept of competition and cooperation, and they have been no longer conceptualized as mutually exclusive (Fülöp & Takács, 2013). Research results increasingly indicated that competition and cooperation should not be viewed as mutually inconsistent, but rather seen as partners (Van de Vliert, 1999). Dichotomization is now seen as irreconcilable with biosocial theories of human behavior that emphasize the subtle interweaving of cooperation and competition as strategies used by individual primates and humans. These theories conceptualize cooperation as the most successful competitive strategy. Actors will choose to cooperate with those who reciprocate cooperation. Therefore, those who defect will be excluded from mutually beneficial exchanges. This is a special kind of social selection and those who are competitive in being cooperative, that is, compete to be selected as partners in cooperation, are in the winning position (Charlesworth, 1996). According to Hawley's "resource control theory," the most successful resource control strategy that leads to social dominance is the double one that applies both pro-social and coercive means (Hawley, 2010). Competition and cooperation are no longer considered mutually exclusive in the business world either. A new term was created: "coopetition" to refer to their simultaneous and intertwined presence between firms (Brandenburger & Nalebuff, 1998).

Each human group and each society is a complex system of cooperative and competitive relationships. The current view is that competition and cooperation are neither mutually exclusive nor inverse motivational and behavioral constructs but they can be simultaneous and their interrelationships cannot be described with simple regularities (Chen, 2008; Fülöp, 2004, 2008).

## CUTTING-EDGE RESEARCH

## THE MULTIDIMENSIONAL NATURE OF COMPETITION: CONSTRUCTIVE AND DESTRUCTIVE COMPETITIVE PROCESSES

Since the 1990s, there have been several studies that aimed at revealing those constituents of a competition that lead to qualitatively different competitive processes. The differentiation between constructive and destructive competitive processes started in the 1990s; however, more extensive research into the nature of these competitive processes appeared only in the 2000s (e.g., Sheridan, & Williams, 2011; Tjosvold, Johnson, Johnson, & Sun, 2006). In terms of the construct of competition, the focus of present day research is to determine the dimensions along which competition can be constructive or when it turns to be destructive, moreover, what constitutes healthy and unhealthy competition.

A number of factors along which qualitatively different competitive processes can be identified were identified. For example, competitive processes can be characterized by their *goals* (e.g., winning/outperforming the other, self-improvement or learning/gaining mastery, etc.), their *function* (e.g., motivation, improvement, self-evaluation, goal attainment, selection), their *focus* (e.g., the self, the goal, the opponent as an enemy to defeat, the competitive parties as a joint unit to be improved) (Fülöp, 2004, 2009). The focus can also be the process (improvement) or the outcome (winning) (Shields & Bredemeier, 2009). These different goals, functions, and foci determine qualitatively different competitive processes.

Constructive and destructive competitive processes differ also in the *relationship among the rivals* as well, that is, how the competitors conceptualize each other; for example, a *friend* and an *active partner* with whom they mutually and actively improve and facilitate each other; a *motivator* who is a kind of impersonal agent to help the self-improvement process and enables one to seek excellence; a *comparative other* who serves as a yardstick for evaluating one's own performance; an *opponent* to win over in order to reach a goal; an *enemy* who is an obstacle to be surmounted or to be defeated. The conceptualization of the rival shapes the opponents' emotions toward each other (e.g., love, respect, aggression, hostility, hate, etc.) (Fülöp, 2004, 2009; Shields & Bredemeier, 2009).

The characteristics of the competitive situation also form the competitive process. *Fairness of the process* has turned out to be one of the most important determinants of the constructive or destructive nature of competition. Competition is destructive if the competing parties break the rules, apply immoral means, cheat, lie, mislead, falsify results, bribe, and so on, in order to win over their rival. When rules are clear and just, the criteria of evaluation are transparent and known by all participating parties; when

the rules are fairly enforced, the probability of a constructive competitive process increases. Other situational factors that proved to be decisive are chances (equal/unequal), size of the reward and the reward structure, perceived resources (limited versus unlimited), time perspective (short or long term). Constructive and destructive competitive processes can be differentiated also by the emotions they evoke in the competitors (e.g., excitement, joy, anxiety, or stress) or by the *intensity* (high, medium, or low) of the competition that takes place between the competing parties (Fülöp, 1992; Fülöp & Takács, 2013; Shields & Bredemeier, 2009; Tjosvold *et al.*, 2006).

Constructive and destructive competitive processes can be characterized by their *consequences* as well; for instance, mobilized energy or exhaustion improved or destroyed the relationship between the rivals, task effectiveness and performance improved or impaired, better or worse, psychological and somatic health (e.g., Murayama & Elliot, 2012; Thornton *et al.*, 2011).

Recent research came to the conclusion that constructive competition does exist in the real world and that this type of competition contributes to task efficiency, creative workplace climate, strong positive relationships, the enjoyment of the experience, the desire to participate and the confidence in working collaboratively with competitors in the future (Fülöp & Takács, 2013; Lauter, Polner, & Orosz, 2012; Orosz, Salamon, Makkai, & Turcsik, 2012; Shields & Bredemeier, 2009; Tjosvold *et al.*, 2006).

#### INTERACTIONS AMONG THE DIFFERENT CONSTITUENTS OF THE COMPETITIVE PROCESS

The above-described various conditions, characteristics, and consequences of competitive processes are interconnected; they do not function in solitaire. Research now focuses on the nature and complexity of these interrelations and how one element may mobilize other elements and builds up to a particular competitive pattern.

For example, high *intensity* increases *negative stress* and the possibility that rivals *break the rules*; furthermore, their attention becomes narrowed and they focus only on *defeating their rival* (Fülöp & Takács, 2013). High intensity may also lead to better performance and a new and higher level of activity (Shields & Bredemeier, 2009). The *intensity* of competition changes with the *rank and the commensurability of the competing parties*, high rankings relative to intermediate ones intensify competition. In contrast, with increasing *the number of competitors*, the intensity of the competitive motivation decreases. The *magnitude of the reward, the prize spread*, that is, the incentive scheme (as economists call it) are also associated with the *intensity* of competition (e.g., Garcia & Tor, 2009).

## COOPERATIVE COMPETITION

By deconstructing the different constituents of a competitive process it became possible to identify what makes *cooperative competition* possible, a competitive process that involves a high degree of cooperation among the competitive parties. The constituents mainly overlap with the factors that characterize the constructive competitive processes (Fülöp & Takács, 2013).

## THE CULTURAL CONSTRUCTION OF COMPETITION

In harmony with the dichotomist conceptualization of competition and cooperation, these constructs were interpreted along the individualism and collectivism cultural dimension. Competition together with independence, autonomy, self-reliance, uniqueness, and achievement orientation had been associated with individualism. Being cooperative, however, has been associated with collectivism, higher interdependence with others, conformity with group norms, and low competitive desire. However, the assumption that high competitiveness is a distinctive characteristic of individualism has been questioned in recent research, indicating that competitiveness can be associated with individualism as well as with collectivism. For example, the distinction between horizontal and vertical individualism and collectivism connected competition with those constructs that emphasize status differences in both, that is, vertical individualism and vertical collectivism) (Triandis & Gelfand, 1998). The evidence of the constructs of self-reliant competition and interdependent competition (Green, Deschamps, & Paez, 2005) also demonstrate that competition is present in both individualistic and collectivistic societies.

Being competitive in an individualistic or a collectivistic society, however, requires different competitive behavior. In parallel with the multifaceted concept of competition research has been focusing on the qualitatively different constructs of competition depending on culture (Fülöp, 2004). The attributed function of competing, the focus of the competitive process, the concept of the rival, the ability to combine competition and cooperation proved to demonstrate cultural differences. For example, the Japanese construct of the meaning of competition makes it possible to combine it with high level of cooperation. According to this concept, competition leads to closer relationships and higher cohesion in the group because competitors consider each other as partners who share the same goal of self-improvement and motivation and by competing they mutually develop and motivate each other (Fülöp, 2004, 2009).

#### THE ROLE OF CULTURE AND SOCIAL CHANGE IN COMPETITIVE PROCESSES

The rapid societal changes from Socialism to a democratic political regime and a market economy in the former Socialist countries of East-Central Europe provided some unique insight into the role of societal context in the formation of attitudes toward competition. As the structural introduction of competition was a key element of the economic and political changes from state-controlled economy to market economy and from the one-party system to democratic elections, it became a unique opportunity to investigate how the concept of competition and competitive attitudes change. The effects of social change did not apply uniformly to an entire population but proved to vary as a function of the individual's age, life course, or developmental status at the time of the social transformation. The "omega-alpha" generation of the transitions, the last children of the old system and the first adults of the new one, proved to establish a more positive and comfortable attitude toward competition and market economy than middle-aged adults and teachers. However, when these post-Socialist adolescents were compared to their Japanese, American, and English counterparts who were born in a society with long-term market economy and democratic traditions, they proved to be alarmingly negative about the competition that actually characterizes their Capitalist society. Adaptation to a new competitive societal context was not only mediated by age and social status but also by personality characteristics. For example, those who were characterized by a higher agency could switch more easily from a dependency and security culture to a competitive enterprise and opportunity culture (Fülöp, 2002, 2005).

#### DIFFERENT TYPES OF COMPETITIVE ATTITUDES AS PERSONALITY CHARACTERISTICS

By leaving behind the unidimensional concept of competition, the concept of competitiveness as an attitude or personality trait has also changed considerably. The major work in this field has been done by Ryckman and his colleagues who over more than two decades (see in Thornton *et al.*, 2011) deconstructed the notion of competitiveness and differentiated three competitive orientations: hypercompetitiveness, personal development competitiveness, and competition avoidance, while they also studied their correlates with psychological health. These competitive characteristics have different psychological health correlates. Competition avoidance has a similar "unhealthy" profile as hypercompetitiveness, while personal development competitiveness was shown to be associated with higher subjective well-being and fewer health problems (Thornton *et al.*, 2011).

## DECONSTRUCTING THE RELATIONSHIP BETWEEN COMPETITION AND MOTIVATION

Competition and cooperation had been connected to other classic dichotomies such as extrinsic versus intrinsic motivation. Motivation theory stated that competition is a kind of extrinsic motivation and if competition is introduced into tasks that destroy intrinsic motivation. Achievement motivation was built on the same type of dichotomy, distinguishing between mastery (learning) and performance (ego, competitive) motivation. Mastery goals, in contrast to performance goals, were shown to be leading to better affective, cognitive, and behavioral consequences and increased learning (Murayama & Elliot, 2012).

However, these constructs have also turned out not to be mutually exclusive, as thought originally. Cooperation combined with competition was found to lead to the highest level of task enjoyment and also to a higher level of performance than pure cooperation or competition (Tauer & Harackiewicz, 2004). The theory of multiple goals that have emerged and related research findings demonstrated that individuals can have various simultaneous goals and that performance goals can be adaptive, leading to positive outcomes in case they are approach goals (trying to perform well compared to others) and not avoidance goals (trying to avoid performing poorly relative to others). It was found that trying to excel, to be the best (approach), in fact, leads to efficient learning and high-level performance and is also associated with intrinsic motivation. Performance avoidance goals, however, undermine performance (Murayama & Elliot, 2012).

## PATTERNS OF COPING WITH WINNING AND LOSING

It is also in the past decade that the psychological consequences of the outcome of competition, that is, winning and losing, have been systematically investigated and analyzed. Recent research revealed that the emotional and behavioral consequences of victory and defeat are not independent but interrelated, that is, how one responds to win is highly predictive of how one responds to loss, and they form qualitatively different coping patterns. Three major patterns have been identified: the *balanced*; the *narcissistic-dominant-aggressive*; and the *avoidant-giving up* coping.

The most adaptive is considered to be the *balanced coping* one. This pattern involves in case of winning positive emotions of joy and pride and seeking new challenges. In case of losing, sadness, and frustration, a mixture of deactivating but also activating emotions are present and they are associated with not giving up but standing up and continuing after defeat.

*Narcissistic-dominant-aggressive coping* is considered to be less adaptive. In case of winning, the reaction is narcissistic self-enhancement and feeling of

superiority, while in case of losing, hatred and aggression toward the winner dominate the emotional and behavioral response.

The *avoidant-giving up* pattern involves in case of winning a paradox reaction of embarrassment and instead of trying to win next time, the avoidance of competitive situations and of new challenges. In case of losing, the leading emotional response is *self-devaluation*, withdrawal and giving up (Bronson & Merryman, 2013; Fülöp & Berkics, 2007).

#### THE PHYSIOLOGY OF COMPETITION

While reactions to winning and losing are deconstructed at the psychological level, there is a growing literature on the neuroendocrinology of competitive behavior, winning and losing (Salvador, 2005). Owing to the progress in measurement methods, now several hormones can be measured in an easy and noninvasive way using saliva samples, removing the need for blood samples. Most of the research so far has concentrated on testosterone and cortisol as they are directly related to dominance behavior and stress responses accompanying competition. The level of basal testosterone and the level of cortisol and their interaction proved to be predictors of the success of the competitive process and to be associated with the psychological reactions of the winner and the loser, for instance, being ready for a new competition after losing, that is, approach or giving up, for instance, avoidance. Economists researching entrepreneurial skills and competitiveness have found that these skills are associated with higher level of fetal testosterone in the mother's blood stream and the higher level of prenatal testosterone results in higher focus on winning in competition (Liening, Mehta, & Josephs, 2012).

The differentiation between the psychology of threat and challenge has also proved fruitful in understanding, for example, approach and avoidance performance goals and the different patterns of coping with winning and losing. Challenge appraisals focus on success and winning (promotion), while threat appraisals focus on threat and not losing (prevention). Recent research identified the cardiovascular markers of these two distinct processes and also the different brain activity that accompany them. For example, on the basis of physiological arousal indexed by heart rate after the instruction to compete it was possible to predict who would win in a competitive game (Blascovich & Tomaka, 1996).

#### COMPETITION AND GENETIC RESEARCH

There is a growing body of research that investigates how key gene variants can alter the neuronal activity and influence particular cognitive-affective reactions to competitive situations and also to winning and losing. The

catechol-O-methyltransferase (COMT) gene regulates the production of neurotransmitters that enable one to perform under competitive pressure. The gene has two variants: the “warrior” gene variant, which is associated with an advantage in the processing of aversive stimuli and the “worrier” gene variant, which is associated with worse performance under stress. On the basis of these genes, it is possible to identify those who suffer from competition and easily become overwhelmed by the intensity of it, and therefore emotionally tend to withdraw, and those who need stress, for example, in the form of intensive competition in order to perform optimally (Stein, Newman, Savitz, & Ramesar, 2006).

#### NEUROIMAGING STUDIES OF COMPETITION AND COOPERATION

Owing to a rapid development of neuroimaging, researchers are now able to locate the cerebral substrates of competing and also of cooperating. These studies typically employ an experimental design in which participants play a computer game (e.g., Ultimatum Game, Prisoner’s Dilemma, gambling tasks) under different experimental conditions (e.g., a human or a computer as a partner; outcome winning or losing; reward conditions) while scanning their brain activation. Studies show that both cooperative and competitive behaviors are linked to executive functions and mentalizing abilities, but they involve specific psychological and cortical mechanisms (Decety, Jackson, Sommerville, Chaminade, & Meltzoff, 2004).

#### KEY ISSUES FOR FUTURE RESEARCH

Research on interpersonal competition takes place in different disciplines and carried out by different professionals. The communication and especially the collaboration among these professionals is however not systematic. Consequently, there are a great number of unanswered questions, especially about the interaction of the different causes and constituents of the competitive behavior.

#### THE INTERACTION OF BIOLOGICAL AND SOCIAL FACTORS

Neurobiological research often has the assumption that the neurobiological milieu shapes and influences behavioral responses. Conceptual shifts, however, have moved research from biological determinism to biosocial models in which the social environment plays a key role in the understanding of behavior–hormone associations. While, for instance, genetic research shows that genes have an effect on how one approaches a competitive situation,

there is growing evidence on the role of parental practices in socializing competitive attitudes and behavior. An example is the rough and tumble play between parents and kids that has a role in regulation of competitiveness and in getting comfortable with the emotional intensity of competition (Bronson & Merryman, 2013). Therefore, future research should be directed to explore how experience and environmental/cultural influences are able to modify the underlying biological structure, thus highlighting the bidirectional nature of experiences and biological disposition.

#### PERSONALITY AND SITUATION INTERACTIONS

The construct of personality rests on the assumption that individuals are characterized by distinctive qualities that are relatively invariant across situations and over time. Personality has a decisive role in how the individual selects, constructs, and processes social information.

Competitiveness as a trait mediates between the characteristics of the situation and the behavior. However, the exact nature of this mediation is still unknown. In case of the hypercompetitive person, competitive behavior may appear even if the situation lacks any obvious competitive element. In the case of a competition avoidant person, it may not appear even if the situation is strictly competitively structured. There are no extensive studies, however, on the opposite effect. If there is a different effect of the situation, that is, reward structure, the rules, the norms, the relationship among the rivals etc. on people with different competitive attitudes etc. Research studying the association between the situational variables and competitive behavior so far has not taken into serious consideration the mediating role of the personality.

#### INTERRELATIONS AMONG THE DIFFERENT CONSTITUENTS OF THE COMPETITIVE PROCESS

There is an accumulated knowledge about the qualitatively different patterns of competition, about their constituents and correlates, but it is still a question to be answered how these different constituents relate to each other in their complexity and how changing one condition (e.g., goal of competition, focus of competition, amount of resources, clarity of rules) affects the others. The understanding of the role of each constituent and their combination has high significance in intervention, that is, to avoid destructive competitive processes and promote constructive ones.

#### ECOLOGICALLY VALID RESEARCH ON COMPETITION

Most of the research on the neurophysiology of competition is experimental and related to structured competitions, that is, contests. There are relatively

few studies that attempt to determine, for example, what kind of hormonal changes occur in the body in real-life competitions. It is methodologically difficult to examine what happens during not institutionalized, informal, spontaneous competitions that are many times extended in time and take place within long-term relationships.

Neuroimaging studies place the competing person among unusual and artificial circumstances that lack face-to-face encounter with the competitor. It remains a question how much the results gained among these circumstances can be generalized to real-life competitive social interactions. Also, the games that are generally used in these experiments are structured according to the “either compete or cooperate” dichotomy, which is already abandoned in other areas of competition research.

#### TOWARD A BIO-PSYCHO-SOCIAL-CULTURAL MODEL OF COMPETITION AND COPING WITH WINNING AND LOSING

It is increasingly difficult to accumulate research findings into a coherent body of knowledge. Researchers of competition represent different disciplines from the biological sciences to social sciences and typically concentrate on the level of explanation that their scientific field represents. For example, researchers of genetics do not have a systematic collaboration with cultural psychologists, economists studying, for example, the relationship between incentive structure and competition just scarcely refer to research on competitive attitudes or motivational styles or to the role of culture. Scientific evidence is mainly discipline based and not integrated into a bio-psycho-social-cultural model of interpersonal competition.

The fact that a person competes in a given situation at a given point of time has multiple (proximate and distal, micro and macro level) determinants and the degree of their influence and the way they interact with each other changes dynamically from person to person and situation to situation. Biological factors, that is, the evolutionary inheritance, genetics, neuroendocrine and neuronal processes function together with sociocultural factors, that is, the political-economical system, the history and the cultural characteristics of a society, gender role stereotypes and expectations, and so on, which in turn shape family socialization practices, family norms and values, and also institutional practices in educational institutions (from nursery to higher education) and in the workplace and also the media. More proximate factors in determining the competitive behavior are, for example, the competitors’ personal characteristics (e.g., age, sex, socioeconomic status and social status in the given group, competitiveness as a trait, coping with winning and losing, motivational type, self-esteem, concept of competition, perception of the rival, etc.) and the structural characteristics of the situation (e.g., resources,

rules, reward structure, hierarchical structure, etc.). These components contribute in interaction to the actual competitive behavior.

A comprehensive explanatory model would be able to prevent debates over the “true” cause of competitive behavior because of highlighting and acknowledging that the same behavior can be explained at different levels and that every unit of analysis is at the very same time both a whole and a part and they dynamically constitute each other. Such a model would also provide a general framework to guide future theoretical and empirical exploration.

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