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The anatomy of competitiveness

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Abstract
A large empirical literature in behavioral economics investigates heterogeneity across individuals and groups in preferences for competition. In this study, we provide a more detailed view on competitiveness by differentiating between three motivations for entering competitions: enjoyment of competition, desire to win, and competition for personal development. We investigate which of these dimensions are picked up by traditional measures of competitiveness; how they predict individual and gender differences in career outcomes; how they predict wellbeing; and how they relate to other personality traits, skills, and preferences. We make a further contribution by showing that willingness to compete is distinct from – and predicts outcomes beyond – general willingness to seek challenges.

Keywords: Competitiveness; gender; labor market outcomes; leadership; personality traits

JEL codes: C91; D91; J24

1. Introduction

Willingness to compete varies strongly across individuals and predicts achievement in education and the labor market. Initial studies in experimental economics focused on documenting that women are less willing to compete in incentivized experimental tasks relative to men (Gneezy et al., 2003; Niederle and Vesterlund, 2007). A growing follow-up literature shows that competitiveness – measured through incentivized choices or survey items – is a strong predictor of labor market outcomes. People who are more competitive choose more challenging study majors, are more successful in their professional careers, and are more likely to hold leadership positions (Buser et al., 2014; Buser et al., 2026).

In this paper, we provide a more nuanced view of competitiveness by differentiating between different motivations for competing with others. Intuitively, being "competitive" can both refer to an enjoyment of competition and to a desire to win or outperform others. Moreover, people may enter competitions for personal development motivations – to improve themselves. It is largely an open question which of these dimensions of competitiveness are picked up by the measures used in the literature, and how they relate to career outcomes and gender gaps. Another question that has so far not been tackled by the literature is in how far measures of willingness to compete pick up a general drive to seek new challenges, whether competitive or not.

The lab-based literature following Niederle and Vesterlund (2007) is mainly focused on gender differences and typically measures willingness to compete as an incentivized binary choice between

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a winner-takes-all tournament and individual piece-rate incentives.[1] These studies explicitly posit taste for competition as a new, separate preference. A disadvantage of using incentivized tournament choices to measure this preference is that they are partially determined by expected performance and risk preferences.[2] Some more recent studies instead measure preferences for competition through non-incentivized questionnaire-based measures. Buser et al. (2026), for instance, introduce a generally worded single-item survey measure of competitiveness and – using the same survey panel used in this study – demonstrate that it predicts the same career outcomes that are predicted by the incentivized choice measure of Niederle and Vesterlund (2007).[3] They also show that competitiveness is a better predictor of career outcomes than questionnaire-based measures of confidence or risk preferences.[4] This literature raises the question of what exactly is picked up by these experimental and survey measures.

We first investigate which of the three dimensions of competitiveness – enjoyment of competition, desire to win, and competition for personal development – are picked up by two standard measures of competitiveness: the incentivized measure of Niederle and Vesterlund (2007) and the survey question of Buser et al. (2026), and to what extent these relationships can be explained by general challenge seeking. We then ask how the different dimensions predict career outcomes and wellbeing, and how they relate to other personality traits and preferences. We also analyze how they differ between men and women and whether they can statistically explain gender differences in labor market outcomes.

We do this through a detailed questionnaire which is based on different competition scales from the psychology literature. The questionnaire is an augmented version of Urbig et al. (2021), who also differentiate between enjoyment of competition, desire to win, and competition for personal development motives.[5] The questionnaire contains several questions for each of the competition motives. We elicit these questions in a representative Dutch survey panel. We then link our data to extensive panel data on other psychological traits – including the Big Five personality traits (Goldberg et al., 2006), grit (Duckworth and Quinn, 2009), the "dark triad" traits (Jonason and Webster, 2010), risk seeking (Dohmen et al., 2011), and social preferences (Falk et al., 2023). The panel data also contains detailed indicators of professional achievement and personal wellbeing.

We document several new patterns. 1. Traditional measures of competitiveness mainly pick up a mix of enjoyment of competition and desire to win. 2. Both enjoyment of competition and desire to win predict success in the labor market, but desire to win is negatively correlated with measures

[1]Niederle and Vesterlund (2007) find that men are much more likely to compete than women. Their result has been replicated many times (see Croson and Gneezy, 2009; Niederle and Vesterlund, 2011; Niederle, 2016; Dariel et al., 2017; Markowsky and Beblo, 2022, for surveys), including in field settings (Flory et al., 2015; Samek, 2019; Buser et al., 2023). Other studies have focused on showing that men react more strongly than women to competitive incentives (Gneezy et al., 2003; Ors et al., 2013). These gender differences in competitiveness have been shown to vary with the social and cultural environment (Gneezy et al., 2009; Almås et al., 2015; Gneezy et al., 2016; Alan and Ertac, 2019; Zhang, 2019; Boneva et al., 2022).

[2]Most experimental studies tackle this issue by measuring risk preferences and beliefs and controlling for them. Some recent studies claim that these controls are insufficient and question whether there actually is a gender difference in taste for competition (Gillen et al., 2019; Van Veldhuizen, 2022).

[3]Other studies that use survey questions to elicit competitiveness include Bönte and Piegeler (2013); Bönte (2015); Bönte et al. (2017); Fallucchi et al. (2020).

[4]Many other studies show links between measures of competitiveness and career outcomes. Buser et al. (2014) and Buser et al. (2017) show that an incentivized measure of competitiveness predicts specializing in more prestigious and math-heavy subjects for Dutch and Swiss students from the pre-university track of secondary school. Reuben et al. (2024) show the same for the starting salaries and industry choices of MBA graduates. Other studies find that competitiveness predicts participating in a competitive high school entrance exam (Zhang, 2012), investment choices of entrepreneurs (Berge et al., 2015), choosing an ambitious college track in high-school (Almås et al., 2016), future salary expectations of undergraduate students (Reuben et al., 2017), and career choices at the vocational education level (Buser et al., 2022). See Lozano et al. (2022) for a survey of this literature.

[5]Urbig et al. (2021) focus on documenting correlations of the three competitiveness dimensions with classic personality traits and gender. In the results section, we provide comparisons between our results and theirs.

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of happiness, mental health, and career satisfaction, while these correlations are positive for enjoyment of competition. 3. Of the three dimensions of competitiveness, enjoyment of competition differs most between men and women and has the highest explanatory power for gender gaps in labor market outcomes. 4. Enjoyment of competition is most strongly correlated with risk taking, confidence, extroversion, and mental stability. Desire to win is most strongly correlated with negative reciprocity, lower agreeableness, lower mental stability, Machiavellianism (a tendency to manipulate others), and narcissism. 5. Survey measures of competitiveness partially pick up general willingness to seek challenges but much less so when controls for standard personality traits and economic preferences are added.

Some of these results confirm the findings of the few past studies that have investigated subsets of our research questions. Bönte et al. (2017) correlate competitiveness due to personal development motives as well as a composite measure of other competitiveness items (some of which also appear in the Urbig et al. (2021) measure of enjoyment of competition which we use in our questionnaire) with an incentivized competition choice. Similar to our findings, they show that general competitiveness predicts the incentivized choice, but willingness to enter competitions for personal development does not. Urbig et al. (2021) show that of the three dimensions of competitiveness, enjoyment of competition differs most strongly between men and women, which is confirmed by our results. They also correlate the different dimensions of competitiveness with established personality traits, finding similar correlations. In terms of the correlations between the different dimensions of competitiveness with career outcomes, we confirm the finding of Urbig et al. (2020) that enjoyment of competition is a better predictor of entrepreneurship than desire to win or competition for personal development and the finding of Bönte and Piegeler (2013) that the gender difference in enjoyment of competition can explain part of the gender gap in entrepreneurship.

2. Data

We collected the data on the Dutch LISS (Longitudinal Internet Studies for the Social Sciences) panel. This is an ongoing online survey panel that has been operating since late 2007. It is based on a true probability sample of households drawn from the population register by Statistics Netherlands (www.lissdata.nl). Approximately 7,500 panel members answer yearly "core" questionnaires which cover topics including work, education, wealth, family, and personality. On top of this, researchers can pay to run questionnaires on the panel, which can then be linked to all other data that is available on the respondents. All LISS data, including researcher-run questionnaires, is publicly available to all researchers.

Our competitiveness survey was conducted in July 2021. On top of the questions that elicit the competitiveness dimensions and challenge seeking, the survey also elicited a range of social preferences (Falk et al., 2023), general willingness to take risk (Dohmen et al., 2011), grit (Duckworth and Quinn, 2009), and general confidence.[6] We additionally link this data to the yearly LISS personality core module, which contains the Big Five personality traits (Goldberg et al., 2006) and a follow-up questionnaire that measures the dark triad personality traits and two measures of cognitive skills (need for cognition and cognitive reflection). We also link our competitiveness questionnaire to two general measures of competitiveness collected on the LISS panel by Buser et al. (2026): an incentivized measure elicited through a procedure that closely followed the design of Niederle and Vesterlund (2007) and a generally worded single survey item ("How competitive do you consider yourself to be?").

The competitiveness survey elicits three dimensions of competitiveness – enjoyment of competition, desire to win and competition for personal development motives – plus general challenge

[6]Confidence is measured through the extent of agreement with the survey item "I have confidence in myself".

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seeking. Most of the questions are taken from the questionnaire of Urbig et al. (2021) who also differentiate between enjoyment of competition, desire to win, and competition for personal development motives.[7] The questionnaire contains the following items – elicited in a randomized order – where respondents are asked to express their agreement on a scale from 1 to 7.

Enjoyment of competition:
I enjoy competing against others
I prefer competing with others when pursuing a goal over pursuing the goal alone
I like situations in which I compete with others
I find competitive situations unpleasant (reverse-coded)

Personal development competitiveness:
Competition allows me to measure my own success
Competition allows me to judge my level of competence
I use competition as a way to prove something to myself
I can improve my competence by competing

Desire to win:
I often try to outperform others
I want to win in both work and games
I try to be the best person in the room at almost anything
It is important for me to outperform others
I find losing very painful

Challenge seeking:
I always look for new challenges
I enjoy working on challenging tasks

Our questionnaire contains three additional questions compared to the questionnaire of Urbig et al. (2021). The first addition consists of the two challenge-seeking questions. We could not find a validated challenge-seeking scale and therefore created our own items, which we kept as general and neutral as possible. The second addition is the fifth desire-to-win question. We added this fifth item based on the intuition that desire to win is also characterized by an aversion to losing. In the online appendix, we show all our main results when excluding this item from the measure of desire to win. Results look very similar.

The social preference questionnaire is based on the Global Preferences Survey of Falk et al. (2023) and includes six questions on negative reciprocity, willingness to punish someone who treats others unfairly (third party punishment), positive reciprocity, trust, and altruism. We construct four social preference measures. Negative reciprocity is the mean of the following two questions: "How willing are you to punish someone who treats you unfairly, even if there may be costs for you?" and "If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so." Trust is measured as the mean of "I assume that people have only the best intentions" (Falk et al., 2023) and "Generally speaking, would you say that most people can be trusted, or that you can' t be too careful in dealing with people?".[8] Prosociality is measured as the mean of "When someone does me a favor I am willing to return it" and "How willing are you to give to good causes without expecting anything in return?" (altruism and positive reciprocity). Third-party punishment is measured by agreement with the statement "How willing are you to punish someone who treats others unfairly, even if there may be costs for you?". Our grit questionnaire is based on the short grit scale of Duckworth and

[7]Their questionnaire items are in turn taken from Spence and Helmreich (1983); Smither and Houston (1992); Newby and Klein (2014); Bönte et al. (2017).

[8]The second trust question is elicited in the LISS Personality core module and is taken from the European Social Survey (ESS).

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Quinn (2009). Table A1 in the online appendix shows descriptive statistics for all survey measures we use in the paper. We also use data from a follow-up questionnaire we conducted in February 2023 that elicits the so-called dark triad traits – Machiavellianism (a tendency to manipulate and exploit others), psychopathy (lack of empathy and remorse), and narcissism (excessive self-love and entitlement) – through the short scale of Jonason and Webster (2010). The same questionnaire also contains two measures of cognitive skills – a short version of the need for cognition scale (Lins de Holanda Coelho et al., 2020)[9] and the three-item cognitive reflection test (Frederick, 2005).[10]

We also use the LISS core questionnaires as the source of measures of labor market outcomes and individual wellbeing. The LISS background data contains each respondent's monthly gross income and level of education. Respondents are asked to update this information every time they answer a survey. The Work and Schooling core module asks respondents to classify their profession.[11] From this, we construct three indicators of professional position: "Management" (respondent indicated that they hold a "higher supervisory profession" at least once over the five years leading up to our survey), "Supervisor" (respondent indicated that they hold a "higher supervisory profession" or an "intermediate supervisory profession"), and "Professional" (respondent indicated that they work in a "higher academic or independent profession"). We also create indicators of entrepreneurship and self-employment.[12] The Work and Schooling core module asks respondents how satisfied they are with several aspects of their current employment.[13] We use the mean of the answers as an indicator of how happy respondents are with their career.

We also use the LISS data to construct several indicators of general wellbeing. The Personality module asks respondents to rate their general happiness on a scale from 0 to 10. The same module asks respondents to rate how close they feel to others, using the Inclusion of Others in the Self scale (Aron et al., 1992). Finally, we use the binary response to the question whether respondents take medication for depression or anxiety from the Health module as an "objective" indicator of wellbeing. Fallucchi et al. (2020) find that their non-incentivized measure of competitiveness predicts being a professional athlete. Inspired by this finding, we include a binary indicator for practicing sports as an additional non-labor market life outcome.[14]

Our ability to differentiate between the different dimensions of competitiveness will partially depend on how strongly they are correlated. The correlation matrix in Figure A1 in Online Appendix A shows that they are highly correlated with each other and with challenge seeking, with correlation coefficients between 0.36 and 0.76. We will therefore base our conclusions mainly on multivariate regressions where we include all measures simultaneously.

[9]Need for cognition measures "the tendency for an individual to engage in and enjoy thinking" (Cacioppo and Petty, 1982) and has been shown to predict fluid intelligence (Fleischhauer et al., 2010; Hill et al., 2013).

[10]The cognitive reflection test consists of three quantitative questions where the most intuitive answer is wrong, and therefore measures a person's "ability or disposition to reflect on a question and resist reporting the first response that comes to mind" (Frederick, 2005).

[11]LISS gives respondents the following answer options: Higher academic or independent profession (e.g. architect, physician, scholar, academic instructor, engineer). Higher supervisory profession (e.g. manager, director, owner of large company, supervisory civil servant). Intermediate academic or independent profession (e.g. teacher, artist, nurse, social worker, policy assistant). Intermediate supervisory or commercial profession (e.g. head representative, department manager, shopkeeper). Other mental work (e.g. administrative assistant, accountant, sales assistant, family carer). Skilled and supervisory manual work (e.g. car mechanic, foreman, electrician). Semi-skilled manual work (e.g. driver, factory worker). Unskilled and trained manual work (e.g. cleaner, packer). Agrarian profession (e.g. farm worker, independent agriculturalist).

[12]We designate as entrepreneurs all respondents who indicated that they are a "director of a limited liability or private limited company" or a "majority shareholder director" at least once over the five years leading up to our survey. We designate as self-employed all respondents who indicated that they are "self-employed/freelancer" or an "independent professional" at least once over the five years leading up to our survey.

[13]Respondents rate their satisfaction with their earnings, working hours, type of work, colleagues, and their current work in general on a scale from 0 to 10.

[14]The indicator consists of the answer to the question "Do you practice sports?".

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An often-cited issue when correlating different survey measures with each other is spurious correlation due to common method bias (Podsakoff et al., 2003). Our empirical design includes several procedural remedies. First and most importantly, we temporally separated the collection of the different competitiveness measures. The general single-item measure of competitiveness and the incentivized choice measure were collected in March 2017 and April 2018 respectively (Buser et al., 2026). More than three years therefore passed between the elicitation of our new questionnaire measures and the elicitation of the standard competitiveness measures we correlate them with. Likewise, the various life outcome measures we correlate with our survey items were collected through the core LISS modules over the course of several years leading up to our survey. Second, there is methodological separation in that different scales were used for our new survey items (1-7) and the single-item measure (0-10) or the incentivized choice (binary). The same is true for the life outcomes and other personality traits which are all measured on different and diverse scales. Third, item order was randomized across respondents within our competitiveness questionnaire. Finally, respondents to the LISS panel are aware that their anonymity is secured, which should reduce social desirability bias that could be correlated across surveys.[15]

3. Results

We present our results in four steps. First, we investigate which of the three dimensions of competitiveness are picked up by traditional measures of competitiveness, and to what extent these measures pick up a general willingness to seek challenges. Second, we show how the dimensions predict labor market outcomes and personal wellbeing. Third, we take a closer look at gender differences. And fourth, we analyze to which extent each dimension of competitiveness is correlated with other personality traits and economic preferences.

3.1. *Which motivations for competing are picked up by standard competitiveness measures?*

We will first ask which of the three motivations for competing are picked up by the generally worded survey question of Buser et al. (2026) and an incentivized tournament entry decision à la Niederle and Vesterlund (2007).[16] The results are shown in Table 1. Columns (1) to (4) show results from regressions of the survey measure on enjoyment of competition, desire to win, and competing for personal development. All measures are standardized and the coefficients therefore represent the increase (in standard deviation units) in general competitiveness that is associated with a one-standard deviation increase in each of the competitiveness dimensions, keeping the other dimensions fixed. In column (2), we add our new survey measure for general challenge seeking. In column (3), we additionally control for risk seeking and confidence, two controls that are often added to regressions to isolate preferences for competition from risk preferences and beliefs. In column (4), we add a range of standard personality traits that are measured in many datasets (grit, extroversion, agreeableness, conscientiousness, stability, and openness). In columns (5) to (8), we repeat these analyses with the incentivized competition choice as the outcome variable. Here, we additionally control for performance in the two baseline rounds. The coefficients therefore represent the difference in the likelihood of choosing the tournament over the piece rate that is associated with a one-standard deviation

[15]These remedies follow the recommendations of Podsakoff et al. (2003).

[16]Both of these measures of competitiveness were collected on the LISS panel by Buser et al. (2026). The survey measure was collected in March 2017 and the incentivized measure was collected in April 2018. Buser et al. (2026) show that – despite being collected deliberately one year apart – the two measures are highly significantly correlated with a correlation coefficient of 0.153 ($p < 0.001$). The survey measure has a test-retest correlation of 0.578 across a four-year period.

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Table 1 What is picked up by standard measures of competitiveness?

	(1) Survey	(2) Survey	(3) Survey	(4) Survey	(5) Choice	(6) Choice	(7) Choice	(8) Choice
Enjoyment	0.256***	0.227***	0.187***	0.165***	0.049**	0.050**	0.053**	0.047**
	(0.028)	(0.028)	(0.028)	(0.030)	(0.020)	(0.020)	(0.021)	(0.022)
Development	-0.106***	-0.118***	-0.115***	-0.097***	-0.043*	-0.043*	-0.046**	-0.049**
	(0.030)	(0.030)	(0.030)	(0.030)	(0.023)	(0.023)	(0.023)	(0.024)
Winning	0.326***	0.290***	0.293***	0.281***	0.041**	0.042**	0.038*	0.045**
	(0.027)	(0.028)	(0.027)	(0.028)	(0.019)	(0.020)	(0.020)	(0.020)
Challenge		0.138***	0.077***	0.053**		-0.002	0.006	0.000
		(0.021)	(0.023)	(0.025)		(0.015)	(0.016)	(0.018)
Adjusted R^2	0.201	0.215	0.236	0.248	0.083	0.082	0.082	0.099
N	3136	3136	3136	3136	1155	1155	1155	1155
Risk and confidence			x	x			x	x
Personality traits				x				x
Score controls					x	x	x	x

Note: The table shows OLS regressions of the standardized single-item survey measure of competitiveness (columns 1 to 4) and the incentivized tournament choice (columns 5 to 8) on the new competitiveness measures. The single-item survey measure and the incentivized choice measure were collected on the LISS panel by Buser et al. (2026) in 2017 and 2018 respectively. Personality controls include grit, extroversion, agreeableness, conscientiousness, stability, and openness. Columns 5 to 8 control for performance in the two baseline rounds of the experiment. Robust standard errors in parentheses; * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

increase in each of the competitiveness dimensions (relative to a mean sample proportion who choose the tournament of 0.26).

Without controls, the generally worded single-item survey measure of Buser et al. (2026) picks up a combination of enjoyment of competition and desire to win. The survey measure also picks up general challenge seeking but controlling for challenge seeking only weakly affects the coefficients on enjoyment of competition and desire to win. When we add controls for risk preferences and confidence in column (3) and other personality traits in column (4), the coefficient on challenge seeking shrinks much more strongly than the coefficients on the competitiveness dimensions. This indicates that standard controls for preferences and personality can help isolate competitiveness from more general challenge seeking. The results for the incentivized choice look quite similar, with enjoyment of competition and desire to win being the two competitiveness dimensions that positively and significantly predict tournament entry. However, the incentivized choice is never significantly associated with our measure of general challenge seeking.

Main result 1: *The measures of competitiveness typically used in the literature are most strongly correlated with enjoyment of competition and desire to win. The survey measure of Buser et al. (2026) additionally picks up general willingness to seek challenges, but this applies to a much lesser extent when standard personality traits are controlled for.*

3.2. Competitiveness and life outcomes

Next, we investigate the predictive power of the three dimensions of competitiveness and general challenge seeking for life outcomes. Figure 1 shows the magnitude and statistical significance of the coefficients from OLS regressions of outcome measures on the standardized competitiveness measures, when included individually and simultaneously. All regressions control for age, gender and education level and the graphs therefore present conditional correlations. Results for continuous outcomes are shown in the top panels. The outcome measures are standardized and the coefficients therefore represent the conditional correlation between a one-standard deviation increase in

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Fig. 1 Conditional correlations between competitiveness and life outcomes

Note: The conditional correlations represented in the graphs are obtained from OLS regressions of outcomes on the standardized competitiveness measures. Outcomes in the top two graphs are continuous and standardized. Outcomes in the bottom two graphs are binary and effects are scaled by dividing by the sample mean of the outcome variable. The left-hand side graphs show results from regressions that include the competitiveness and challenge seeking measures individually, controlling for age, gender, and education level. The right-hand side graphs show results from regressions that include all four measures simultaneously, controlling for age, gender, and education level. The sample is restricted to individuals who are between 25 and 65 years old. Significance levels are based on robust standard errors; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See the tables in Online Appendix B for the underlying regression coefficients.

each competitiveness measure and the outcome in terms of standard deviations. Results for binary outcomes are shown in the bottom panels. To make coefficients comparable across common and rare outcomes, we show the conditional correlations in terms of percent of the sample mean of

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the outcome variable.[17] The underlying regression coefficients are shown in the tables in Online Appendix B.

We consider several indicators of labor market success and individual wellbeing. The labor market outcomes consist of monthly income at the time of the survey plus binary indicators for having held a management position, having held a supervisory position, having held a professional position, and having been self-employed or an entrepreneur during the five years leading up to the survey. The indicators of individual wellbeing consist of self-rated happiness, self-rated job satisfaction, self-rated closeness to others, and a binary indicator for having taken medication for depression or anxiety during the five years leading up to the survey. We also include practicing sports as an additional non-labor market life outcome that is plausibly related to competitiveness.

The left-hand side graphs show coefficients from regressions where the competitiveness dimensions and challenge seeking are included separately, controlling for gender, age, and education level. Enjoyment of competition, desire to win, competing for personal development, and general challenge seeking all positively and significantly predict success in the labor market as measured by income or holding a management or supervisory position. Enjoyment of competition also significantly predicts entrepreneurship but not self-employment. While all dimensions of competitiveness predict labor market outcomes, only enjoyment of competition and challenge seeking also positively and significantly predict wellbeing. All dimensions of competitiveness correlate with practicing sports.

The magnitudes of these correlations are economically meaningful. For example, a one-standard deviation increase in enjoyment of competition is associated with increases in income and happiness of 0.11 and 0.09 standard deviations respectively. It is also associated with an increase of roughly 20 percent in the likelihood of having held a management or supervisory position.

The right-hand side graphs show coefficients from regressions where the three dimensions of competitiveness and challenge seeking are included simultaneously. Given the strong correlations between the four measures, this will help to disentangle which dimension of competitiveness predict which outcomes. The results show that enjoyment of competition, desire to win, and challenge seeking – but not competing for personal development motives – are all statistically significant predictors of labor market success. However, while both enjoyment of competition and challenge seeking are positively associated with wellbeing, desire to win is consistently negatively associated with wellbeing conditional on the other competitiveness dimensions. A one-standard deviation increase in desire to win is associated with 0.07-0.12 standard deviations lower happiness, career satisfaction and closeness, as well as with a 25 percent increase in the likelihood of recently having taken medication for depression or anxiety.

Main result 2: *Enjoyment of competition and desire to win are both strong predictors of labor market success but have very different implications when it comes to wellbeing. Desire to win is negatively associated with happiness and mental health while associations are positive for enjoyment of competition.*

3.3. Gender differences

The economic literature on willingness to compete has to a large extent been focused on gender differences. Most experimental studies either document gender differences in competitiveness (Gneezy

[17] That is, we regress the binary outcome on competitiveness and then divide the coefficient by the sample mean of the binary outcome. The coefficient therefore represents the percent increase in the probability that the outcome is equal to one that is associated with a one-standard deviation increase in competitiveness.

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et al., 2003; Niederle and Vesterlund, 2007) – typically finding that women are on average less willing to compete than men – or investigate mechanisms to mitigate the gender gap.[18] Studies linking measures of willingness to compete to labor market outcomes have investigated whether the gender gap in competitiveness can statistically explain gender differences in education and labor market outcomes.[19] In this section, we compare the explanatory power of the competitiveness dimensions for gender differences in income and professional status.

Figure A2 in Online Appendix A shows gender differences in competitiveness and labor market outcomes. The upper panel shows the mean of the standardized competitiveness dimensions and challenge seeking – plus the single-item survey question of Buser et al. (2026) – by gender. Men score themselves significantly higher on all dimensions ($p < 0.001$ in all cases).[20] The gender difference is largest for enjoyment of competition (0.49 standard deviations) and smallest for challenge seeking (0.19 standard deviations).[21] Women also have a 1452 lower average monthly income than men[22] and are much less likely to have held a management, supervisory, or professional position, or to have been an entrepreneur ($p < 0.001$ in all cases). There is no gender difference in the likelihood of being self-employed.

Figure 2 shows the impact of including each of the competitiveness dimensions – as well as all three combined – on the gender gap in the five mentioned labor market outcomes for which we find a significant gap, controlling for age and education. For comparison purposes, the figure also shows the impact of including challenge seeking and the single-item measure of Buser et al. (2026). Consistent with enjoyment of competition differing most between men and women – and it being a strong predictor of labor market outcomes – it has the strongest explanatory power for gender differences among the three competitiveness dimensions. Inclusion of enjoyment for competition in a regression diminishes the estimated gender gap in income by approximately 8 percent. It also shrinks the gender gap in holding a supervisory position by 21 percent, the gender gap in holding a management position by 11 percent, and the gender gap in entrepreneurship by 16 percent.

Including all three measures at the same time increases the power to explain gender gaps relative to including each dimension separately. Competitiveness can then explain 10 percent of the gender income gap, 24 percent and 14 percent of the gaps in supervisory and management positions, and 17 percent of the gender difference in entrepreneurship. The explanatory power of challenge seeking is much lower throughout. It is also notable that combining the three detailed measures of competitiveness increases the explanatory power for gender differences in labor market outcomes relative to the generally worded single-item measure. This means that – when possible given space and time constraints – it may be worth eliciting our 15-item questionnaire rather than just a single general item.

Main result 3: *The gender difference in enjoyment of competition statistically explains a significant part of gender differences in income and professional rank. Controlling for the three competitiveness dimensions simultaneously further increases explanatory power, also relative to using a single-item measure of competitiveness.*

[18] See for example Balafoutas and Sutter (2012), Niederle et al. (2013) or Czibor and Dominguez Martinez (2019) on affirmative action.

[19] See, for example, Buser et al. (2014) and Buser et al. (2017) on study choices in high school, and Reuben et al. (2024) and Buser et al. (2026) on labor market outcomes.

[20] p-values are from OLS regressions of outcomes on a gender dummy.

[21] Urbig et al. (2021), from whose questionnaire most of the competitiveness questions are drawn, look at gender differences in three dimensions of competitiveness – enjoyment of competition, desire to win, and competing for personal development – and also find the largest gender difference for enjoyment of competition.

[22] Many women in the Netherlands work part time.

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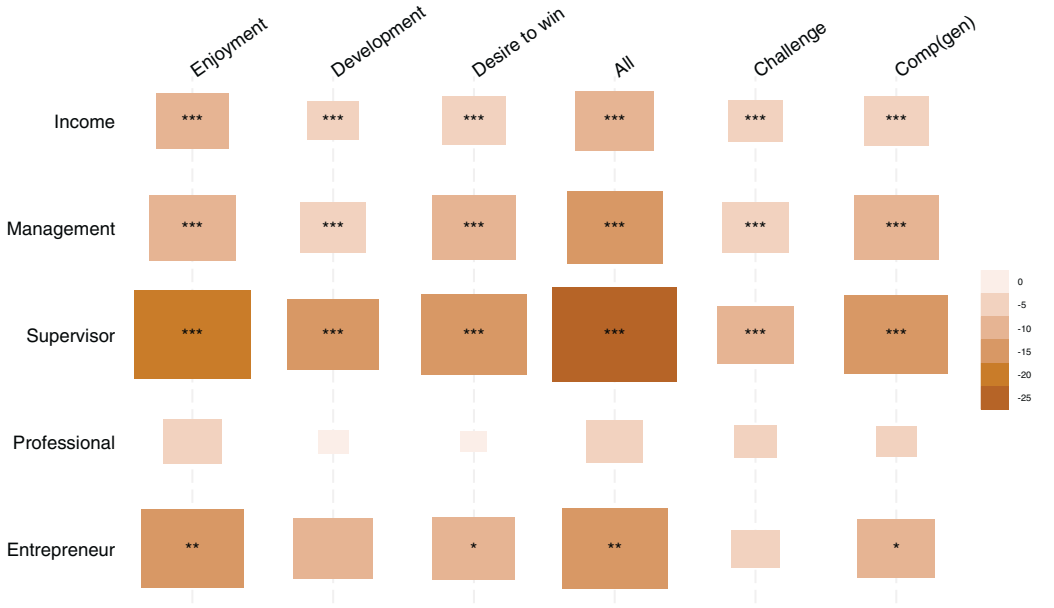


Fig. 2 Explanatory power of competitiveness for gender gaps in labor market outcomes

Note: The graph shows the explanatory power of different competitiveness measures for gender gaps in labor market outcomes. The squares represent the difference (in percent) in the gender gap in labor market outcomes between OLS regressions that do and do not include the various measures of competitiveness. Significance stars represent the level of statistical significance of the difference in the gender coefficient between the regressions with and without competitiveness measures included (using Stata's suest command); * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The sample is restricted to individuals who are between 25 and 65 years old. All regressions control for age, age squared and education level dummies. See the tables in Online Appendix B for the underlying regression coefficients.

3.4. Competitiveness and other psychological traits

Finally, we investigate how the three dimensions of competitiveness and challenge seeking relate to other personality traits and preferences. On top of the competitiveness measures, our questionnaire also elicited risk seeking (Dohmen et al., 2011), grit (Duckworth and Quinn, 2009), a range of social preferences (Falk et al., 2023), and general confidence. In a follow-up questionnaire, we elicited the "dark triad" personality traits (Jonason and Webster, 2010) and two measures of cognitive skills: the need for cognition scale (Lins de Holanda Coelho et al., 2020) and the cognitive reflection test (Frederick, 2005). We additionally use the Big Five personality traits (Goldberg et al., 2006) which are elicited in the yearly LISS personality core module. Figure 3 shows the magnitude and significance of the coefficients from OLS regressions of these traits on the four competitiveness and challenge seeking measures, both when included individually and simultaneously. The underlying regression coefficients are reported in the regression tables in Online Appendix C.

The left-hand side graphs of Figure 3 show coefficients from regressions where the measures are included individually, controlling for gender and age. The right-hand side graphs show coefficients where the four measures are included simultaneously. In the top panels, we report results for economic preferences and cognitive skills (risk seeking, confidence, negative reciprocity, trust, prosociality, third party punishment, need for cognition, and cognitive reflection). In the bottom panels, we look into correlations with classic personality traits (grit, the Big Five traits, and the dark triad).

The first thing that stands out is that challenge seeking is much more strongly correlated with most of the other traits than the three competitiveness dimensions. The exceptions are negative reciprocity and the dark triad traits which are not or only weakly correlated with challenge

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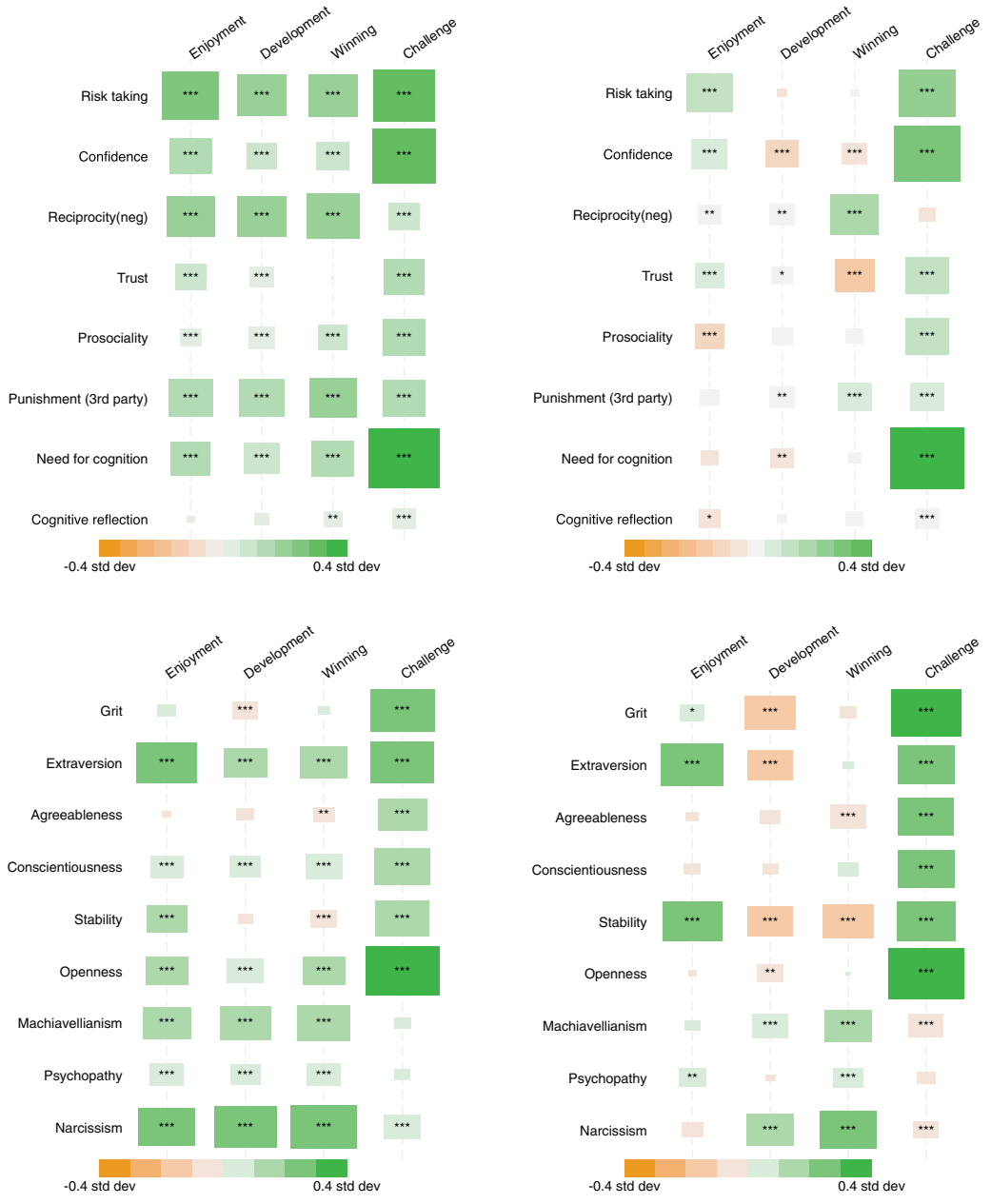


Fig. 3 Conditional correlations between competitiveness and other psychological traits

Note: The conditional correlations represented in the graphs are obtained from OLS regressions of trait measures on the standardized competitiveness and challenge seeking measures. The dependent variables are standardized. The left-hand side graphs show results from regressions that include the four measures individually, controlling for age and gender. The right-hand side graphs show results from regressions that include all four measures simultaneously, controlling for age and gender. Significance levels are based on robust standard errors; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See the tables in Online Appendix C for the underlying regression coefficients.

seeking. This again indicates that controlling for standard personality traits and economic preferences in regressions can help isolate competitiveness from general challenge seeking. It also extends the conclusion of Buser et al. (2026) that competitiveness is a separate trait that is not

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well captured by traditionally measured traits and preferences to our new, more detailed survey measures.[23]

We will now look at the multivariate regressions on the right to check whether enjoyment of competition, desire to win, and competition for personal development are differentially associated with other traits and preferences. Enjoyment of competition is most strongly correlated with risk taking, confidence, extroversion, and mental stability. Desire to win and personal development competition are more strongly associated with negative reciprocity, lower mental stability, and higher levels of Machiavellianism and narcissism. Personal development competition is additionally associated with lower levels of confidence and grit. The results further confirm that enjoyment of competition and desire to win – although strongly correlated – are distinct tendencies, with desire to win presenting a darker side of competitiveness.

Main result 4: *General challenge seeking is well-captured by traditionally measured personality traits and preferences. Enjoyment of competition and desire to win are more weakly correlated with other traits, confirming that competitiveness is an important trait in its own right. Enjoyment of competition is most strongly associated with extroversion, mental stability, confidence, and risk seeking, while desire to win is most strongly associated with negative reciprocity, narcissism, Machiavellianism, and lower mental stability.*

Other studies have documented correlations between competitiveness and classic personality traits and preferences. Most importantly, Urbig et al. (2021) relate the three dimensions of competitiveness – enjoyment of competition, desire to win, and competing for personal development – to the six personality traits defined by the HEXACO framework.[24] They find that, in a sample of Colombian university students, desire to win is negatively correlated with agreeableness, competing for personal development is positively correlated with emotionality (a trait that is negatively related to mental stability), and enjoyment of competition is positively correlated with extroversion and negatively with emotionality. Our results confirm all of these associations. Buser et al. (2026) show that their single-item measure of general competitiveness is positively correlated with extroversion and openness (and to a lesser extent mental stability and conscientiousness), as well as risk tolerance and confidence. Many experimental studies present evidence that incentivized competition decisions are predicted by measures of risk preferences and confidence (Niederle and Vesterlund, 2011; Niederle, 2016). Balafoutas et al. (2012) experimentally investigate the link between competitiveness and distributional preferences and find that efficiency-minded participants choose competition more often, while spiteful and inequality averse participants avoid it (see also Bartling et al., 2009; Buser et al., 2025; Buser and Sangi, 2025).

4. Conclusion

Individual preferences for competition have consistently been shown to predict education and labor market outcomes as well as gender differences in career choices. In this paper, we provide a more nuanced view of competitiveness by differentiating between different motivations for competing with others. The main narrative that emerges from our data is that willingness to compete – as measured in the literature – captures at least two separate dimensions: enjoyment of competition and desire to

[23] We can confirm this by looking at the R-squared of regressions of challenge seeking and the competitiveness dimensions on the other traits. For challenge seeking, the incremental R-squared of the other traits (risk seeking, confidence, social preferences, cognitive skills, grit, the Big Five traits, and the dark triad traits) above gender and age is 41 percent. For enjoyment of competition this is 20 percent, for desire to win it is 23 percent, and for personal development competition it is 20 percent.

[24] Five of the HEXACO traits are closely related to the Big Five traits. The HEXACO model includes an additional sixth trait, honesty-humility. See Lee and Ashton (2004).

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win. While these two dimensions are strongly correlated, they are differentially associated with life outcomes and other personality traits.

Both people who compete because they enjoy it and people who are driven to compete by a desire to win and outperform others are professionally more successful than other people. But otherwise, they look very different. People who enjoy competing tend to be happy, mentally stable, extroverted, and willing to take risk. People driven by a desire (or need) to win tend to be less happy, more neurotic, more disagreeable, more manipulative, and more willing to engage in negative reciprocity.

Our results also show that while competitiveness is strongly associated with general challenge seeking, it is distinct. Enjoyment of competition and desire to win predict labor market outcomes and personal wellbeing on top of general challenge seeking. Moreover, challenge seeking is relatively well captured by standard personality traits and preferences, indicating that controlling for other traits partially succeeds in differentiating willingness to compete from a general willingness to seek challenges. Finally, we contribute to the large literature on gender differences in competitiveness by showing that enjoyment of competition differs more between women and men and has stronger explanatory power for gender differences in labor market outcomes than desire to win or general challenge seeking.

Combined, our detailed measures of competitiveness have stronger explanatory power for gender differences than a single-item questionnaire measure of general willingness to compete, indicating that – time and space permitting – it is worth eliciting a detailed competitiveness scale rather than a single item. We also show that for some outcomes, enjoyment of competition and desire to win show divergent correlations, indicating that collecting our more detailed questionnaire rather than a single-item measure can lead to additional qualitative insights. Nevertheless, it is important to emphasize that the three dimensions of competitiveness are strongly correlated with each other and with the single-item measure of Buser et al. (2026), indicating that there is a general preference for competition that is picked up by either measure.

Past studies have documented associations between competitiveness and many labor market and education outcomes (Lozano et al., 2022). Other studies have uncovered features of the cultural and social environment that correlate with and influence preferences for competition (Gneezy et al., 2009; Almås et al., 2015; Alan and Ertac, 2019; Boneva et al., 2022; Buser et al., 2021; Jø rgensen et al., 2022). When thinking about the origins and consequences of individual and gender differences in preferences for competition, it is interesting to have a close look at what exactly "competitiveness" means. Recent studies have used a variety of methods to differentiate preferences for competition from beliefs and general risk seeking (Gillen et al., 2019; Buser et al., 2026; Van Veldhuizen, 2022; Lozano and Reuben, 2025). Our results indicate that the reason someone is attracted to competition might matter too.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/esa.2026.10032.

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