I. INTRODUCTION

The relationship between competition and well-being is a debated issue at both the individual and aggregate level. This is also because there is no consensus, either in the literature or in society, on the meaning (and hence the desirability) of competition, especially concerning market competition.[1] Basic economics textbooks show that the highest levels of both consumers and total surplus are obtained in perfectly competitive markets, and that competition is a strong incentive for firms to invest and innovate, thus influencing productivity and economic growth (Stucke, 2013).

In contrast to this view, outside the realm of economics (particularly for people with poor economics literacy) competition usually has negative connotations: in a competitive environment, some win by defeating others; furthermore, being competitive is considered in some ways synonymous with greed, envy and narcissism (Rubin, 2003).

These considerations suggest that attitudes to market competition can differ considerably, and that the actual effects that a competitive behavior can produce on total wealth and individual well-being depend on how competition is perceived by economic agents.

On the one hand, competition is considered a zero-sum game that produces a few happy winners and many discontented losers. This approach usually implies that the available resources are fixed and increasing competition may only change the allocation of these resources among individuals. The combination of zero-sum thinking and competitive thinking can lead to wrong conclusions about some causal effects in the socio-economic environment: for instance, that increased imports cause unemployment because the total number of jobs is fixed, or that taxation reforms always generate 'winners' and 'losers' because taxation redistributes a fixed sum among various groups of taxpayers (Rubin, 2003).

On the other hand, competition is considered to be a positive sum game that leads to gains for everyone. This positive view of competition is associated with the idea that competition increases total wealth and may contribute to making all individuals in the society better-off. Rubin (2014) stresses this concept further, arguing that market economies are positive sum games in which both the parties involved (i.e. the buyers and the sellers) must expect to gain, otherwise the transaction will not occur. In Rubin's view, voluntary market transactions are the essence of win-win positive sum cooperative behaviors.

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1 In this paper we focus on market competition, where sellers compete with each other to maximize profits or market shares. More in general, market competition implies that economic agents engage in production and/or trade to maximize their objective functions (i.e. profits for firms, utility for consumers). We acknowledge that the concept of competition may be used in several other fields and with different meanings. In sports, for example, people may also compete for fun or to show their abilities, rather than to win the competition and the final prize.

Attitudes to competition may influence not only individual well-being but also individuals' concerns about their relative position in the society and the demand for so-called 'positional goods', which are "those things whose value depends relatively strongly on how they compare with things owned by the others" (Frank, 1985). In light of this definition, contrary to what is assumed in standard consumer theory, the individual utility from consumption of a large number of goods depends not only on the amount that each individual consumes, but also on the amount that others consume.

The importance of positionality in influencing individual utility is highlighted also in the growing 'happiness literature': the finding that the growth of real national income is not associated with increasing perceived happiness (the so-called 'Easterlin Paradox' 1974, 1995) is consistent with a model in which consumption enters the utility function also in relative terms. Being positional towards certain goods entails a direct comparison with others' consumption, which may elicit feelings of rivalry and envy, with subsequent effects on individual well-being. Hence, the demand for positional goods should be closely related to a negative view of competition: if individual utility from consuming positional goods depends also on relative consumption by the reference group, the propensity to be positional may imply that one can be richer and happier only at the expense of others.

By contrast, a positive attitude to competition, since it does not imply a direct comparison with others, should not be related with positional concerns, but it may positively affect well-being.

In light of these two quite opposite views of competition, and given that people's positionality and well-being are influenced by their attitude to competition, the main contribution of our research is to empirically test whether and what type of competition affects both positional concerns and happiness[2]. A different attitude to competition may change people's disposition towards positional goods and influence their well-being quite differently, but these issues have not yet received much attention in the literature.

In order to disentangle the effects of different attitudes to competition on both positional concerns and happiness, we exploit a rich and original data set based on an ad-hoc survey that we carried out among the first-year students attending courses in economics and sociology at a mid-sized university in the North of Italy in March 2012. To construct our measures of positive and negative attitude to competition, we combine students' opinion on two statements aimed at capturing

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[2] In this paper the terms "happiness", "well-being" and "life satisfaction" are used interchangeably. In the empirical analysis we actually measure life satisfaction on the basis of the answers to the following question: "Using a scale from 1 to 10 (where 1 means not at all satisfied, 10 means completely satisfied), please rate, all things considered, how satisfied you are with your life as a whole these days".

different beliefs on competition, namely "Competition is good, it stimulates people to work hard and develop new ideas" and "You can become rich only by damaging someone else".

The main results of the empirical analysis confirm that the attitude to competition matters for both positionality and well-being. A negative attitude toward competition increases, other things equal and taking potential endogeneity into account, the probability of being positional, while a positive opinion of competition is associated to happiness. Furthermore, the degree of positionality *per se* is not significantly related to happiness.

In light of the growing literature on gender and competitiveness, we also explore gender differences in beliefs about competition and their effects on individual well-being. While we do not detect significant differences in attitudes to competition among young men and women, we find gender differences in the relationship between such attitudes and both the probability of being positional and life satisfaction. More specifically, a negative opinion of competition increases the probability of being positional especially for women, while a positive opinion of competition is significantly and positively associated with life satisfaction especially in the case of men.

The remainder of the paper is structured as follows: in Section II, on the basis of the relevant literature, we present the theoretical framework linking perceived competition to both the demand for positional goods and well-being. In Section III we extensively discuss the data used and the definitions of the variables of interest in our analysis, while in Section IV we report some basic descriptive statistics. In Section V we present our empirical strategy, and in Section VI we discuss the main econometric results and a number of robustness checks. The last Section concludes.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Our empirical analysis builds on two main strands of literature: the first investigating the relationship between competition and well-being; the second related to the demand for positional goods and its effects on well-being.

Regarding the first strand of literature, a number of experimental studies point out that competing in a zero-sum game (or rivalry) produces negative effects on both individual behavior and well-being. For example, Schwieren and Weichselbaumer (2010) show that individuals are more likely to cheat when they have to perform a certain task under a competitive treatment, where the level of competition is induced by using a compensation scheme based on relative performance. Low-ability individuals drive this result, but the authors conclude that a 'dog eats dog' society may induce the temptation to cheat also among high-ability individuals. Furthermore, since competition emphasizes personal success, it shifts attention from the well-being of the group to that of the individual, thus lessening social cohesion. Brandts et al. (2009) studied the effects of competitive rivalry in a social

dilemma with a fixed group of players with fixed roles, in which information on subjective well-being and disposition towards others was obtained by surveying the participant's emotions before and after the experiments. They found that, in comparison with no competition, the presence of competition neither increased efficiency nor yielded any gains in earnings. Moreover, competition had a clearly negative impact on the disposition toward others and on the experienced well-being of the subjects more directly involved in the competitive process (i.e. they competed with other players to be chosen to actually play the game). Brandts et al. (2009) concluded that, in their experimental environment, competition did not appear to be a positive force.

Wittchen et al (2013) used an experimental setting in which participants had to perform simple computer-based tasks and could compete as either a representative of a team or as an individual. Competition was elicited by informing the participants that they were competing with someone else and that only the winning person/team could take part to a lottery distributing performance-related incentives. They found that, compared to non-competitive work, competition increased individual effort by producing costly-side effects in terms of stress, as measured by cardiovascular reactivity. Furthermore, females were more responsive to inter-group competition than to inter-individual one.

The above experimental studies consider competitive behaviors based on rivalry and/or relative performance, which are close to our negative definition of competition. Furthermore, none of them explicitly discusses the role of different attitudes to competition in influencing well-being.

This relationship is the core of the empirical analysis conducted by Barrios (2015) on the basis of field data. The author investigates the relationship between competition and happiness using data from the fourth wave (2005-2008) of the World Value Surveys for 56 countries. He measures market competition based on individuals' self- reported positioning between the following two statements, located at the two extremes of a 10-point scale: "Competition is good. It stimulates people to work hard and develop new ideas" and "Competition is harmful. It brings out the worst in people". In this setting, he distinguishes between good and harmful competition using a categorical variable ranging from 1 (very positive attitude to competition) to 10 (very negative attitude to competition). Ordered logit estimates show a non-linear association between happiness and competition. In particular, individuals who really appreciate competition and those who really dislike it report no significant differences in their level of happiness. Furthermore, Barrios (2015) does not find statistically significant differences by gender, but his results highlight the role played by cultural factors, since the effect of perceived competition on well-being varies with some religious traits.

Another strand of literature that is relevant to our empirical analysis investigates the demand for positional goods and its effects on both individual and aggregate well-being. Frank (1985) develops

a formal model in which the utility from consuming positional goods depends both on individual absolute consumption and on how this amount compares to that consumed by others. One of the main implications of this model is that the consumption of positional goods generates negative externalities[3]: an increase in someone's consumption translates into a decrease of the relative status of some others in the relevant reference group, inducing an over-consumption of those goods (Heffetz and Frank, 2008). Furthermore, in order to prevail over the others, people may prefer a situation in which they consume (earn) less than in an alternative situation, as long as their consumption (income) is higher than that of the others.

Several studies have empirically tested these implications (e.g. Alpizar et al., 2005; Celse, 2012; Hillesheim and Mechtel, 2013; Solnick and Hemenway, 1998 and 2005; Solinck, et al., 2007). Most of them show that relative consumption matters for many goods, but the degree of positionality is quite heterogeneous across countries and goods, being relatively higher in the USA compared to other countries (such as France and China), in the case of more visible goods (compared to less visible ones), in the case of 'goods' (compared to 'bads'), and in the case of public goods (compared to private ones). Furthermore, people are more positional when choosing for their children than for themselves. Most of these studies draw their conclusions on the basis of small samples consisting of students and faculty members of specific universities, but similar results are obtained from larger random samples of the population (Grolleau et al. 2012).

Recent studies also show that social comparison, particularly in terms of relative income, has a direct effect on happiness, but the sign of this effect is ex-ante ambiguous (Clark and Senik, 2010). On the one hand, if the individual is poorer than the comparison group, an increase in the average income of the latter may negatively affect subjective well-being ("envy effect"). However, the same change may positively affect subjective well-being if the individual considers it informative of her future prospects ("signal effect"). Using data from the German Socio Economic Panel matched with detailed information on the socio-economic features of the neighborhood where people live, Dittmann and Goebel (2010) show that life satisfaction increases when a person lives in a neighborhood with a higher socioeconomic status, but the gap between the latter and the individual socio-economic status has a negative effect on life satisfaction, confirming the prevalence of the "envy effect". On the basis of the same data, Barcena-Martin et al (2016) point out that the sensitivity of life satisfaction to relative income depends on how distant the individual's income is with respect to others' income. More specifically, the "envy effect" is more intense than the "signal effect" when the distance between individual income and that of the comparison group is relatively

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[3] Negative externalities occur when someone's behavior has a detrimental effect on a third party. In this case, the relative improvement in someone's position causes a reduction in the utility of the others.

small. The "envy effect" also emerges in rural developing countries, pointing out that social comparison is an important determinant of subjective well-being also at low levels of absolute income (Reyes-Garcia et al, 2015). Similar results are found when subjective well-being is measured through job satisfaction: on the basis of different samples and estimation strategies, a number of studies conclude that job satisfaction is negatively influenced by the average income of a comparison group, which may be defined in terms of co-workers, family members or friends (see Clark et al. 2008 and Dolan et al. 2008 for an extensive review).

When the "envy effect" prevails, people work also to improve their relative position in the social rank order. To this aim, they will work too hard, at the expense of leisure and other pursuits (Layard 1980). The result is a distortion of the work-life balance toward self-defeating work (Layard 2005), with subsequent negative effects on well-being.

Bringing these two strands of literature together, we assume that the attitude to competition may influence both individual positional concerns and subjective well-being.

More specifically, we expect that the demand for positional goods, which implies competition for higher rank or status, is positively related to a negative idea of competition, which implies that someone may improve his/her position only to the detriment of others. Furthermore, because a negative attitude to competition triggers excessive work, stress and negative feelings such as envy and resentment, it should have a direct negative effect on individual well-being.

On the contrary, a positive attitude to competition should not be related with positional concerns because it does not involve a direct comparison with others, but it may positively affect well-being, also by favoring more trust and cooperative behaviors (Helliwell and Wang 2010; Algan and Cahuc 2013).

Finally, the literature on positional goods and on social comparison suggests that positional concerns may directly affect individual well-being, but its actual effect is *a priori* ambiguous, since it depends on the actual relative positions of individuals in the society: individuals with positional concerns who are relatively better-off should be happier than individuals with positional concerns who are instead worse-off. Furthermore, among the latter the final effect on subjective well-being depends on the prevalence of the "envy effect" compared to the "signal effect".

Gender differences

A recent but growing strand of socio-economic literature has been studying gender differences in attitudes to competition (see Niederle and Vesterlund 2011 for an extensive review). Such differences are traceable in early childhood and have been first documented in the educational and evolutionary psychological literature: boys spend more time playing competitive games than girls,

who instead prefer games with no winner; furthermore, these differences increase with age (Campbell 2002). If women, even the most able, prefer to avoid competition and systematically under-perform relative to men in competitive environments, they may be less likely to choose competitive industries/occupations and to seek promotions or wage increases. Since many high-profile, high-earning occupations are usually characterized by highly competitive settings, women's reluctance to compete may contribute to explaining persistent gender differences in the labor market, despite significant improvements in female education. Although the socio-economic literature has not yet reached a unanimous consensus, a number of laboratory studies find that, conditional on performance, women are less likely to self-select into competitive incentive schemes (such as tournament schemes compared to piece rate schemes) than men (Niederle and Vestlund 2007; Dohmen and Falk 2011; Datta Gupta et al. 2013). Furthermore, women are much less effective than men once they enter competition (Gneezy et al. 2003). On the contrary, field studies provide more contrasting evidence: whereas some research confirms that in real life situations women tend to compete less than men and to perform worse under competitive pressure (Gneezy and Rustichini 2004; Jurajda and Munich 2011; Ors et al. 2013), other studies find no statistically significant gender differences in attitudes to competition (see for example Lavy (2013) on high school teachers in a performance-based pay tournament and Paserman (2010) on professional tennis players in the Grand Slam tournaments).

Most of both laboratory and field studies also highlight that gender differences in competitiveness are due more to gender differences in beliefs and overconfidence than to gender differences in risk aversion (Niederle 2014).

In light of this evidence, in what follows we shall test whether there are gender differences in attitudes to competition and in the effect of the attitude to competition on both positionality and well-being. More specifically, we expect women to be less competitive than men, regardless of the type of attitude to competition considered. Furthermore, since women shy away from competition more than men, we also expect a stronger negative association between a negative opinion of competition and well-being in the case of women compared to men.

III. DATA AND DEFINITIONS

In order to address the relationship between competition, positional goods and happiness, we use an original data set created on the basis of a survey that we administered in March 2012 to all the first-year undergraduate students attending a course of either introductory economics or sociology at the

University of Bergamo, a mid-sized university in the North of Italy. The final sample consisted of 397 students, of whom 289 were attending the economics course and 108 the sociology course.[4]

In line with Solnick and Hemenway (1998), the first part of the survey consisted of hypothetical questions that presented two states of the world. In the first one, the respondent obtained more than others in society (the so-called *positional case*), while in the second one both the respondent and the others had more than in the positional status, but the respondent obtained less than others in society (the so-called *absolute case*).

There follows an example of two states of the world[5]:

  A. Your current yearly income is €50,000; others earn €25,000
  B. Your current yearly income is €100,000; others earn €200,000

State A is the *positional case*; state B is the *absolute case*. Participants were asked to choose the state that they preferred. They could also declare that they were indifferent between the two states.[6] There is evidence showing that people tend to outweigh losses compared to gains and, with questions of this type, the respondents seem to consider the first alternative as a *status quo* - and hence they evaluate whether they would like to change to the second state (Solnick and Hemenway 1998). In order to prevent the results being driven by the order of the alternatives, we prepared two versions of the survey, which differed only in the order in which the two states of the world were presented. We then assigned them randomly to the students.[7]

The students were asked to evaluate their positional concerns with respect to a number of items: income, leisure, education, attractiveness, intelligence and education. Furthermore, they were asked

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[4] Economics is taken by students graduating in either economics or management. Sociology is taken by students graduating in either education science or psychology. Therefore, in our survey we interviewed students from four different curricula. Furthermore, given the number of potential attending students, in Spring 2012 there were three introductory economics courses, with the same program but taught by different instructors. First-year students were randomly assigned to one of these courses on the basis of the initial letter of their last name. Only one sociology course was offered in Spring 2012. None of the first-year students taking economics (sociology) could take sociology (economics) before or at the time of the survey.

[5] In the survey we indicated that prices were the same in states A and B.

[6] An important feature of these questions is that they are purely hypothetical, rather than referring to actual behavior. The use of hypothetical questions may raise criticisms because the subjects might behave differently if they actually were in the hypothetical situation and, therefore, the answers given to our survey would not be reliable. Nonetheless, in the literature there is considerable agreement on the use of hypothetical questions in surveys (Solnick and Hemenway, 1998). Hypothetical questions have been recently used also in large-scale surveys, such as the 2012 Programme for International Student Assessment (PISA) of the OECD (see Annex 6 in OECD 2013)

[7] 180 students (45% of the sample) filled out the version with the positional case presented first; 217 students (54% of the sample) filled out the version with the absolute case presented first. We did not find any statistically significant difference in the share of students choosing the positional case by version of the survey.

to answer similar questions about the attractiveness, intelligence and education of their (hypothetical) child.[8]

To measure attitudes toward competition, we used the answers to the following two statements: "Competition is good, it stimulates people to work hard and develop new ideas" and "You can become rich only by damaging someone else". Answers were based on a 10-point scale, where 1 meant "completely disagree" and 10 "completely agree"[9]. This choice was related to the idea, stressed in the Introduction, that competition can be seen either as a positive sum game, which produces potential gains for all, for example by stimulating people to develop new ideas, or as a zero-sum game, implying that I can become richer only if someone else becomes poorer. Individuals with a positive attitude to competition should strongly agree with the first statement and strongly disagree with the second one, while the opposite should hold for individuals with a negative opinion on competition.

In our analysis, we combined the two statements in order to classify the respondents according to their attitude to competition. More specifically, we classified individuals into three main (mutually exclusive) groups: those who believed that competition is positive, those who believed that competition is negative, and the remaining ones. More specifically, we defined a first dummy (which we named POSITIVE COMP) that took value 1 for respondents who strongly agreed with the statement "Competition is good, it stimulates people to work hard and develop new ideas" and strongly disagreed with the statement "You can become rich only by damaging someone else". Similarly, we defined a second dummy (NEGATIVE COMP) that took value 1 for respondents who strongly disagreed with the first statement and strongly agreed with the second one. All the remaining respondents (who, for example, strongly agreed with the first statement but did not strongly disagree with the second one) were classified in a residual third group. We constructed our measures given the answers distribution for the two statements. The median of the answers to the statement "Competition is good, it stimulates people to work hard and develop new ideas" was 8, while the median of the answers to the statement "You can become rich only by damaging someone else" was 3. We then considered as individuals with a positive opinion of competition those whose

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[8] The translation of the whole questionnaire is reported in Appendix B.

[9] These statements are taken from the World Value Survey, where they are used with a corresponding opposite statement at the two extremes of a 10-point scale. Individuals are asked to position themselves on the scale according to whether they agree more with the sentence on the left (corresponding to 1) or with the sentence on the right (corresponding to 10). In the World Value Survey questionnaire, the first statement that we used ("Competition is good, it stimulates people to work hard and develop new ideas") is the sentence on the left, while the opposite statement on the right is "Competition is harmful. It brings out the worst in people''. This is the question used also in Barrios (2015) to identify different attitudes to competition. The second sentence that we used ("You can become rich only by damaging someone else") was the statement on the left, while the opposite statement on the right was "Wealth can grow so there's enough for everyone". In order to simplify the questionnaire and reduce uncertainty in the answers, also given that our respondents were young students, we preferred to present only one statement at a time and ask the respondents whether or not they agreed with that statement using a 10-point scale.

answer was above the median (hence from 8 to 10) in the case of the first statement and below the median (hence from 1 to 3) in the case of the second one. In a similar vein, we considered as individuals with a negative opinion on competition those who answered below the median (7 or less) to the first statement and above the median (4 or more) to the second one.[10] In our opinion, compared with the use of a single question, this classification based on the combination of two statements allowed a more precise identification of those with either a truly positive or a truly negative attitude to competition, since answers had to be coherent across statements.[11]

The survey included also a list of items about life satisfaction and about satisfaction with relationships with family members or friends, quality of leisure, health and study. Satisfaction with each aspect could be expressed on the basis of a scale ranging from 1 (completely dissatisfied) to 10 (very satisfied). In addition, we included several questions to which the students were asked to indicate their opinion about matters related to government intervention and society. Also for these questions, answers could be given on the basis of a 10-point scale (where 1 was completely disagree and 10 completely agree).[12]

Finally, the survey contained some background questions, such as students' age, gender, marital status, type of secondary education (including final grade of high school diploma), nationality and family background (including the level of education of both parents).

IV. DESCRIPTIVE EVIDENCE

Table 1 reports the share of individuals choosing the positional status over the total amount of respondents by type of good. Our results in the first column confirm the existence of substantial heterogeneity across goods, with a higher share of positional individuals registered for intelligence and income compared to education and especially leisure. Around 48% of the students are positional on income, but only 38.8% are positional on leisure, confirming the results found in the literature. Furthermore, people are more likely to select the positional state when choosing for their children than for themselves on all the items considered (i.e. intelligence, beauty and education).

Our score for positionality (which we label *Score_all* and is the simple sum of all the positional dummies) is around 3.9, implying that on average the respondents were positional on around half of the items considered.

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[10] In Section V we report the results of a sensitivity analysis based on alternative definitions of these variables.

[11] The answers to the two statements were actually not statistically correlated (the correlation index was 0.036), suggesting that they capture different aspects of competition and their joint use should provide a more precise classification of individuals according to how they perceive competition.

[12] Also these questions are a simplified version of standard questions from the World Value Survey, in which individuals have to position themselves on a scale that ranges from 1 to 10 between two opposite statements.

There is both experimental and field evidence showing that students choose their field of study also on the basis of their attitude to competition. Furthermore, the latter may differ between students majoring in economics or business compared to students majoring in social and human sciences because of, respectively, the economic and sociological theories they learn during their studies (Marwell and Ames 1981; Frank et al. 1993; Frey and Meyer 2003 and 2004).[13] When we use the department as a first proxy for attitude to competition, we find that, with the exception of intelligence, economics students are more positional than sociology ones, particularly in the case of 'visible' goods such as beauty and income. In columns 2 and 3 of Table 1, we report the share of positional individuals by type of goods and department. More than half of the students attending economics are positional on income, while only one third of students attending sociology are positional on income. The overall score for positionality reveals similar trends, being significantly higher for economics students compared to sociology ones (4.10 and 3.43 respectively). In both cases the t-test confirms the existence of significant differences by department.

TABLE 1

In the last three columns of Table 1 we split our sample according to our more direct indicator of competition and we classify students into the three groups discussed earlier: those who clearly perceive that competition is positive, those who perceive that it is negative and the remaining ones. With the exception of leisure, individuals with a negative opinion on competition are the most positional ones for all the items considered, particularly in the case of income and intelligence (of both themselves and their children). Almost 58% of individuals with a negative opinion on competition are positional on income, ten percentage points higher than those with a positive attitude to competition. This is confirmed by the value of the overall score, which is the highest for people with a negative perception of competition (4.23, compared to 3.98 for those with a positive perception and 3.77 for the others). The reported t-tests confirm that these differences are statistically significant. By contrast, individuals with a clear-cut opinion on competition, regardless of whether it is positive or negative, are more positional than the others in terms of leisure.

Notice that the perception of competition - and the degree of positionality - are likely to be related to the type of department.

Figure 1 actually shows that the attitude to competition is not the same across departments. While the share of students without a clear-cut opinion on competition is roughly the same in economics

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[13] Notice that participants to our survey were first year students. Hence, the learning effect may be less relevant than self-selection based on individual characteristics.

and sociology, the share of those perceiving competition as positive is higher among economics students, while the share of those who think that competition is negative is higher among sociology ones.

These results suggest that the attitude to competition is rather heterogeneous also within each department, and that the latter alone is therefore a too rough proxy for that aspect.

FIGURE 1

Similar heterogeneity emerges also in terms of happiness. In the survey we asked the students to evaluate their overall satisfaction with their lives using a scale from 1 (not satisfied at all) to 10 (completely satisfied). In figure 2 we plot the relative distribution by department (upper panel) and by attitude to competition (lower panel).

FIGURE 2

The first graph clearly shows that the happiness distribution for economics students is more skewed to the right than that for sociology ones. That means that, compared to students attending sociology, a higher share of students attending economics courses recorded relatively high scores. Similarly, the second graph highlights that the happiness distribution of those with a positive opinion of competition is more skewed to the right than that of those who perceive competition as negative.[14] The happiness distribution of the remaining students lies somewhere between the previous two. This result confirms the idea that a positive attitude to competition is associated with higher happiness.

Overall, the descriptive evidence suggests that the attitude to competition matters for both positionality and happiness, but it seems important to distinguish whether this attitude is positive or negative. Perceiving competition as a zero-sum game is in fact positively correlated with being positional on many goods, particularly on income, while it is negatively associated with happiness. On the contrary, perceiving competition as something positive seems positively correlated with happiness, while it does not appear to be clearly associated with positionality.

In the next Sections we shall turn to the econometric analysis. We shall focus on positionality on income in order to investigate further the effect of competition on both the probability of being positional and on life satisfaction.

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[14] A two-sample Kolmogorov-Smirnov test for equality of distribution functions confirmed that the happiness distribution for students with a positive opinion on competition was statistically different from that of students with a negative opinion (p-value of the combined K-S test = 0.029)

V. ESTIMATION STRATEGY

The twofold aim of the empirical analysis was to investigate whether and how different opinions on competition affect both the propensity to be positional on income and happiness.

Regarding the relationship between competition and positionality, our main research hypothesis was that positional concerns on income should be correlated with a negative attitude to competition, which assumes that competition is a zero-sum game and someone can be richer only if someone else is poorer. On the contrary, a positive attitude toward competition, which is based on the idea that competition stimulates growth and cooperative behaviors, should not be related with positional concerns.

In order to test these hypotheses, we first estimated the following positionality equation:

$$\text{POS INCOME}_i = \alpha_1 \text{ POSITIVE COMP}_i + \alpha_2 \text{ NEGATIVE COMP}_i + \alpha_3 X_i + \mu_i \qquad (1)$$

where the dependent variable is a dummy variable that takes value 1 if the i-th student preferred the positional state on income and 0 otherwise; POSITIVE COMP and NEGATIVE COMP are dummy variables capturing, respectively, positive and negative competition as defined in Section III (the "other students" is the reference group); X is a set of control variables (namely, department, age, gender, marital status, nationality, type of secondary education and corresponding final grade, year of enrollment at the university, mother's and father's level of education) [15]; μ is the error term. Given the binary nature of the dependent variable, we estimated equation (1) using a probit model.

The second main aim of the empirical analysis concerned the relationship among life satisfaction, positionality and competition. On the one hand, being more positional may have a negative correlation with life satisfaction, also by favoring negative emotions such as envy and frustration. On the other hand, the attitude to competition may have a direct impact on life satisfaction also once controlling for the positional concerns of the individuals. Attitude to competition may damage the relationship with other people (in the case of a negative attitude) or it may foster ethical and cooperative behaviors that increase well-being (in the case of a positive attitude).

Hence, we estimated the following happiness equation:

$$\text{LS}_i = \beta_1 \text{POS INCOME}_i + \beta_2 \text{ POSITIVE COMP}_i + \beta_3 \text{ NEGATIVE COMP}_i + \beta_4 X_i + \nu_i \qquad (2)$$

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[15] For detailed definitions and basic descriptive statistics see Table A1 in Appendix.

where LS is a measure of life satisfaction and all the other variables have the same meaning as discussed above. Equation (2) was estimated by OLS.[16]

In order to interpret the estimated coefficients as causal effects of the attitude to competition on positionality and life satisfaction, respectively, we should take proper account of potential endogeneity. In our specifications, we controlled for a number of factors (such as ability, as captured by the graduation mark from upper secondary school, and family background) which should simultaneously influence beliefs on competition, positional concerns and happiness. However, we cannot rule out the possibility that there may be other unobserved factors (such as motivation, optimistic/pessimistic view of life in general) that can determine both individual beliefs about competition and the dependent variables of interest. For example, we may expect that optimistic individuals are more likely to have a positive opinion on competition and to be happier than pessimistic ones. Furthermore, in case of subjective measures, people may use scales in different manners, so that a score of 8 on a 10-point scale can have different meanings for different individuals.[17]

In order to take account of potential unobserved heterogeneity, we exploited information about positional concerns on other items different from income and about satisfaction with specific realms of life to compute some sort of individual 'pseudo' fixed effects. More specifically, in the positionality equation we added as a further control the sum of all the positional dummies except that on income. This variable, which we label *Pseudo fixed effects (Score)*, measures the average degree of positionality of a certain individual. Hence, when we included it in our estimates, we could interpret the effect of attitude to competition on the probability of being positional on income given a certain individual reference level of positionality. Similarly, in the happiness equation we added among the controls a measure that took into account the average individual satisfaction with a number of specific aspects of life (namely: health, study, family, friends, quantity and quality of leisure) and we labeled this new variable *Pseudo fixed effects (Mean)*. When we added this control in the happiness equation, estimates of the effect of attitude toward competition on life satisfaction could be interpreted as the marginal effect given a certain individual reference level of happiness,

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[16] The dependent variable was based on a 10-point scale and hence took integer values from 1 to 10. We also performed ordered probit estimates and Pseudo-OLS (POLS) estimates based on the linearized version of the dependent variables (Van Praag and Ferrer-i-Carbonell 2006). The main results were qualitatively unchanged and are available upon request.

[17] This is evident in cross-country comparisons of statistics on happiness, which always rank Nordic countries highest and Mediterranean nations lowest regardless of the aspect of life considered (work, health, family, overall life) and of objective conditions (Easterlin 2001; Layard 2005). This is because people in different countries perceive subjective questions differently, also in light of quite different historical, cultural or religious backgrounds. A similar problem, albeit of lower intensity, may arise when comparing relatively homogeneous individuals (such as students in our case) within a country.

which captured unobserved heterogeneity also in terms of different interpretations of the 10-point scale used to measure it.

To further control for potential endogeneity, as a robustness check we also performed a two-stage procedure. First, we estimated the probability of being one of the three types of individuals in terms of attitude to competition (i.e. those who feel that competition is positive, those who feel that competition is negative, and the others), and then we used these estimates to control for endogeneity in our main equations.

Given the multinomial nature of the endogenous variable, in the first stage we estimated the following equation using a multinomial logit:

$$T_i = \beta_T'X_{Ti} + \varepsilon_{Ti} \qquad (3)$$

where T is an indicator variable for the three types discussed above, X_T is a vector of observable characteristics, β_T the corresponding parameters to be estimated and ε_T the error term.

From this first equation, we retrieved a set of correction terms (sorts of Inverse Mills Ratios) that we added as controls in both the positionality and the happiness equation to take into account the possible correlation in the unobservables of the two models, as follows:

$$Y_i = \gamma_1 DT_i + \gamma_2 X_i + \gamma_3 E(\varepsilon_{Ti}/T_i) + \varepsilon_i \qquad (4)$$

where Y is our dependent variable (i.e., positionality or life satisfaction), DT_i is the set of dummy variables related to types (and γ the corresponding parameters of interest to be estimated), and $E(\varepsilon_{Ti}/T_i)$ is a function of the estimated probabilities from equation (3), capturing the correlation between the unobservables of individual types and either the positionality or the happiness equation. X, and ε have the same interpretations as above.

The set of correction terms from a multinomial logit were obtained using the procedure proposed by Dubin and McFadden (1984), as follows:

$$E(\varepsilon_T/T=i) = \sum_{j \neq i}^{m} \left(\frac{Pj \ln Pj}{1 - Pj} + \ln Pi \right) \qquad (5)$$

where P are estimated probabilities from equation (3).

As exclusion restrictions for identification, we assumed that peers may influence individuals' opinions about competition, but peers' opinions about competition should not directly influence

individuals' positional concerns and happiness. In our context, we can consider classmates as the group of peers; hence, as instruments we used the shares of students in the individual's class who thought that competition is, respectively, positive or negative.

VI. MAIN RESULTS

Table 2 shows the estimated coefficients related to the attitude to competition in the positionality equation. Since we might expect students enrolled in the department of social and human sciences to be less competitive (and therefore less positional) than those enrolled in the department of economics and business, in the first specification we use only the dummy Sociology as a first proxy for competition. In the second specification we add the two dummies related to positive and negative competition (considering the "other students" as the reference group), which allow us to disentangle the effects of a different attitude toward competition on positional concern. In column (3) we control for other observable individual characteristics, while in the last column we further control for potential unobserved heterogeneity using the *Score* variable described in the previous Section. This last specification is our preferred one.

TABLE 2

Regarding attitude toward competition, our estimates show that individuals who have a negative opinion on competition are more likely to be positional: the estimated marginal effect is positive and statistically significant. On the contrary, the marginal effect estimated for the dummy on positive competition is not significantly correlated with the probability of being positional on income. These estimates are rather robust to model specification, including controls for individual average degree of positionality.[18]

Interestingly, we find a negative and statistically significant coefficient for the dummy Sociology, confirming the prediction that the students of this department were less positional than those in business and economics. The dummy Sociology remains statistically significant (and negative) also once we control for individual attitude to competition, but our results clearly show the existence of heterogeneity in attitude to competition – as captured by our dummies POSITIVE COMP and NEGATIVE COMP – also within the department.

Overall, our analysis provides evidence that different opinions on competition seem to be strongly correlated with positionality; in particular, a negative belief about competition increases the

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[18] The estimated marginal effect for the variable Score is positive and statistically significant, suggesting that individuals who are overall more positional are positional also on income.

probability of being positional on income. Note also that, with the exception of the *Score*, all the estimated coefficients for the other individual controls in specifications (3) and (4) are not statistically significant, in line with similar findings by Solnick and Hemenway (1998) and Grolleau et al. (2012) (see Table A2 in Appendix) [19].

Table 3 reports the main estimates of the happiness equation using a similar outline in terms of model specification across columns.

TABLE 3

In the first specification we control only for the positional dummy and the dummy Sociology. The former does not seem significantly correlated with life satisfaction, while the students attending the sociology course (and hence enrolled in a human sciences degree) seem less satisfied with their lives than those enrolled in either economics or management. In the second specification, we add our indicators of different attitudes to competition. Estimates show that a positive belief about competition is associated with higher life satisfaction, while a negative idea of competition is associated with lower life satisfaction. These results are confirmed even when we add the other control variables (column (3)). Estimates with the additional control *Mean*, which should capture further unobserved heterogeneity and work as a sort of individual fixed effect, confirm the positive relationship between a positive attitude to competition and happiness (see last column in Table 3).[20]

Overall, we find that the different types of competition influence individual well-being: a positive attitude to competition seems to have a positive impact on life satisfaction, while a negative attitude has a negative effect or no effect on well-being. This result confirms that not all the types of competition are the same, and that the different ways in which people consider competition matter when we analyze the implication in terms of well-being. Finally, we do not find any evidence that positionality has a significant correlation with our measure of satisfaction.

In order to test whether our estimates were sensitive to the indicators of competition used in the previous tables, we re-estimated our models using the two original (10-points scale) variables as measures of the attitude to competition. Given the wording of the two statements (see again Section 2), a positive attitude to competition is associated with high (low) scores of the first (second) statement, while the opposite occurs in the case of a negative attitude. In order to take into account that our preferred indicator was based on the combination of the two original (continuous)

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[19] In our case, this result may be also due to the rather homogeneous sample – first-year undergraduate students – used in the empirical analysis. Note also that the estimated coefficients for the individual controls were not statistically significant also when we did not control for attitude to competition. Results are available upon request.

[20] We tested the multicollinearity issue using the VIF – variation inflation factor – test. The value of this test in the last specification of Table 3 is 1.20

variables, we included also the interaction term between the two regressors. Our main estimates in Table 4 show that a high agreement with the sentence "You can become rich only by damaging someone else" has a positive and statistically significant effect on the probability of being positional on income (Columns 1 and 2), while a high agreement with the sentence "Competition is good, it stimulates people to work hard and develop new ideas" has a positive and statistically significant effect on happiness (Columns 3 and 4). However, in both models the interaction coefficient is negative, implying that the marginal effect decreases if the evaluation of the other type of competition increases. This corroborates the need to use both statements to identify individual attitude toward competition better.

TABLE 4

As a further robustness check for potential endogeneity, we applied the two-stage procedure discussed in Section 4. The main second stage estimates are reported in Table 5: the first two columns refer to the equation on positional concerns about income, the remaining two to life satisfaction. Columns differ for their specification (i.e. without controls for 'pseudo' fixed effects in Columns (1) and (3), with these additional controls in Columns (2) and (4)). Since the correction terms computed from the first stage estimates are estimated variables, we report bootstrapped standard errors. Our estimates overall confirm that, even after controlling for potential endogeneity, a negative perception of competition increases the probability of being positional, while a positive perception of competition increases life satisfaction. Furthermore, even if the exclusion restrictions significantly influence the probability of being a certain type in terms of attitude to competition in both models, the additional regressors from the first stage are jointly statistically significant only in the positionality equation, while they are not statistically significant in the happiness equation, implying that further sources of endogeneity may be less relevant in this second equation. [21]

TABLE 5

Following the growing strand of literature on gender differences in attitudes to competition, we also tested for the existence of significant differences in the attitude to competition between men and

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[21] Estimates of the first stage and complete estimates of the second stage are available upon request. Furthermore, in the case of happiness we also used as additional instruments students' opinions on some general statements related to income inequality, government intervention and the determinants of success. The opinion on these general matters should be correlated with the opinion on competition, but it should influence happiness only through its effect on attitude to competition. These estimates are similar to those presented in Table 5 and are available upon request.

women and whether that attitude could have heterogeneous effects on both positionality and happiness by gender.

With our data, we could not test gender differences in actual behaviors, but we could gain some insights on gender differences in beliefs about competition and their effects on individual well-being. For example, women may shy away from competition because, compared to men, they are more likely to have a negative idea about it, particularly if they have also higher levels of altruism and stronger preferences for redistribution, as shown by evidence from both the laboratory and the field (see Bertrand 2011 for a literature review on gender and social preferences).

Table A3 in the Appendix shows no statistically significant gender differences in either attitude to competition or positional concerns about income or mean happiness. The share of women perceiving competition as something positive is slightly higher than that of men, but a similar result emerges also in the share of individuals believing that competition is negative and in the share of those who are positional on income. On the contrary, mean happiness is slightly lower for women than for men (7.63 and 7.75 respectively), with the highest level registered for men with a positive opinion of competition (8.12) and the lowest level registered for women with a negative idea of competition (7.23).

Despite similar attitudes to competition, estimates by gender reported in Table 6 reveal interesting gender differences in the relationship between such attitudes and both the probability of being positional on income and life satisfaction. While a negative opinion of competition increases the probability of being positional especially for women, a positive opinion of competition is significantly and positively associated with life satisfaction especially in the case of men. Furthermore, when we do not control for 'pseudo' individual fixed effects, we find a strong negative and statistically significant correlation between a negative opinion of competition and happiness only in the case of women.[22] On the whole, our results, although weakly statistically significant (also due to the relatively small size of the two subsamples), seem to suggest that a negative opinion on competition is detrimental particularly in the case of women, while a positive attitude to competition is positively associated mainly with males' well-being.

TABLE 6

VII. CONCLUDING REMARKS

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[22] The values of VIF test in specification (6) and in specification (8) were respectively 1.15 and 1.20, confirming the absence of multicollinearity.

In this paper we have empirically investigated whether and what type of competition affects both positional concerns and happiness. The literature on positional concerns and the experimental evidence on the effect of competition on well-being highlight that a negative attitude to competition should affect whether or not individuals are positional, and it should negatively affect individual well-being, also by fostering negative emotions such as envy and frustration. On the contrary, a positive attitude to competition should not be related with positional concerns, but it may positively affect well-being, also by favoring more trust and cooperative behaviors.

The empirical analysis, based on data from an ad-hoc survey carried out in March 2012 among first-year students attending courses of economics and sociology at a mid-sized university in the North of Italy, confirms that not all the types of competition are the same: while a negative perception of competition increases the probability of being positional and is negatively related to life satisfaction, a positive perception of competition increases life satisfaction. These results are robust to alternative definitions of the competition indicators and to alternative ways to control for potential endogeneity. In line with previous experimental studies (Brandts 2009; Wittchen et al, 2013), we find that a negative perception of competition is negatively related to individual well-being. Furthermore, our results confirm that a positive attitude to competition is positively related to happiness, as found in previous studies based on field data for a larger sample of the population and different countries (Barrios 2015). Differently from previous studies, we also tested the relationship between positional concerns and well-being, finding no statistically significant results, both with and without controls for attitude to competition. In light of our theoretical framework, this finding may be explained by the fact that we measured whether individuals cared about relative consumption (and this should have influenced the arguments of their utility function), but we did not know how they actually fared relative to their reference group, which should be the relevant factor influencing the well-being of positional people. Furthermore, by bringing positional concerns into the relationship between attitude to competition and well-being, we can also explain the non-linear relationship between happiness and competition found in previous studies (Barrios 2015): as long as people with a very negative attitude to competition are positional, they should display a relatively high level of happiness if they fare relatively well – in terms of consumption, social rank or status – compared to their reference group.

Finally, our estimates by gender show that, while there are no statistically significant differences in beliefs about competition between men and women, a negative opinion of competition increases positionality particularly in the case of women, while a positive opinion of competition is positively related to males' well-being.

Non-economists tend to view competition as negative, and our descriptive evidence by department actually shows that the share of students perceiving competition as negative was higher among sociology students than those studying economics. This result confirms the idea that usually, mainly among people with no interest in economics or with relatively low economics literacy, the term 'competition' is associated more with negative factors (such as selfishness, unethical behavior, negative disposition towards others and envy) than with positive ones (such as higher consumer surplus, lower prices, higher variety and quantity of goods, greater employment opportunities, growth, and well-being).

From a policy perspective, our results point out that both policy makers and economists should stress that competition is not necessarily a zero-sum game, and that market economies can generate potential gains for all. In this perspective, competition is not the opposite of cooperation, and the latter plays an important role also in market economies. This change of perspective on competition may be achieved also by supporting economics literacy in (high) schools and by training teachers so that they have the knowledge and/or teaching tools with which to correct these misconceptions.

If a positive attitude to competition becomes the norm in the population, this should reduce the struggle to prevail over others and increase cooperative behavior, with positive effects on individual and social well-being.

This study also has some limitations, which should be considered in interpreting the results. The main limitation concerns the sample used, which consisted only of Italian college students. While a homogeneous sample allows to better control for a number of sources of potential endogeneity (for example, it mitigates the absence of control variables related to religious belief and cultural traits that may simultaneously affect both people's idea of competition and well-being), we are aware that the results cannot be directly generalized to the whole population or to other contexts. Future research based on different samples and countries should take into account the role of other personality traits and that of institutions in affecting attitudes to competition, positional concerns and well-being. Furthermore, the attitude to competition was computed on the basis of self-reported answers, which may be affected by cognitive factors (such as the ordering and wording of questions) and lead to biased estimates (Bertrand and Mullainathan 2001). Although most of the questions that we used were taken from official validated surveys (such as the World Value Survey), and although we have proposed alternative ways to take potential endogeneity into account, further insight could be gained by using experimental games in which the attitude to competition is inferred from individuals' actual behavior in different environments.

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Table 1 – Share of individuals choosing the positional status by type of good, department and attitude to competition

		Department				Attitude towards competition					
	All	Economics	Sociology			Good	Bad	Others			
	(a)	(b)	(c)	(b)-(c)		(d)	(e)	(f)	(d)-(f)		(e)-(f)
income	0.481	0.533	0.333	0.200	***	0.489	0.571	0.442	0.047		0.129 **
education	0.351	0.391	0.241	0.150	***	0.394	0.364	0.327	0.066		0.036
leisure	0.388	0.394	0.352	0.043		0.468	0.377	0.350	0.119 **		0.027
IQ	0.654	0.644	0.676	-0.032		0.511	0.714	0.690	-0.180 ***		0.024
beauty	0.429	0.460	0.324	0.136	**	0.372	0.442	0.438	-0.066		0.004
child education	0.406	0.419	0.361	0.058		0.426	0.442	0.381	0.045		0.061
child IQ	0.703	0.702	0.704	-0.001		0.681	0.779	0.686	-0.005		0.093
child beauty	0.509	0.533	0.435	0.098	*	0.553	0.532	0.478	0.075		0.055
Score_all*	3.908	4.099	3.426	0.673	***	3.978	4.230	3.769	0.209		0.461 *
N Obs	397	289	108			94	77	226			

Note:* Sum of positional dummies
*** p<0.01. ** p<0.05. * p<0.1

Table 2 – Attitude to competition and positional concerns on income

Dependent variable: dummy equal to 1 if positional on income. 0 otherwise

Marginal effects from Probit estimates

	(1)	(2)	(3)	(4)
Sociology	-0.203***	-0.216***	-0.248***	-0.209***
	(0.054)	(0.054)	(0.062)	(0.064)
POSITIVE COMP		0.035	0.025	0.044
		(0.0612)	(0.063)	(0.0647)
NEGATIVE COMP		0.157**	0.149**	0.123*
		(0.067)	(0.069)	(0.071)
Individual controls	No	No	Yes	Yes
Pseudo fixed effects (Score)	No	No	No	Yes
Observations	395	395	382	368
Presudo R-squared	0.024	0.034	0.042	0.078

Note: Robust standard errors in brackets
*** p<0.01. ** p<0.05. * p<0.1

Table 3 - Positional concerns, attitude to competition and happiness

Dependent variable: life satisfaction. OLS estimates

	(1)	(2)	(3)	(4)
POS INCOME	-0.011	0.019	-0.008	-0.013
	(0.137)	(0.137)	(0.138)	(0.112)
Sociology	-0.287*	-0.234	-0.182	-0.097
	(0.159)	(0.154)	(0.179)	(0.143)
POSITIVE COMP		0.305**	0.303**	0.285**
		(0.152)	(0.157)	(0.130)
NEGATIVE COMP		-0.347*	-0.299*	0.013
		(0.186)	(0.173)	(0.143)
Individual controls	No	No	Yes	Yes
Pseudo fixed effects (Mean)	No	No	No	Yes
Constant	7.763***	7.727***	7.340 ***	1.859**
	(0.104)	(0.113)	(0.725)	(0.791)
Observations	392	392	379	379
R-squared^	0.010	0.036	0.065	0.371

Note: Robust standard errors in brackets

*** $p<0.01$. ** $p<0.05$. * $p<0.1$

Table 4 – Alternative definitions of attitude to competition

Marginal effects from probit estimates for positionality; OLS estimates for life satisfaction.

	Positional on income		Life satisfaction	
	(1)	(2)	(3)	(4)
POS INCOME			-0.021	-0.016
			(0.136)	(0.112)
statement 1 (a)	0.038	0.040	0.176***	0.092*
	(0.026)	(0.027)	(0.064)	(0.053)
statement 2 (b)	0.098**	0.086*	0.007	0.107
	(0.046)	(0.048)	(0.115)	(0.095)
statement1* statement2	-0.010*	-0.010*	-0.009	-0.021*
	(0.006)	(0.006)	(0.014)	(0.012)
Individual Controls	Yes	Yes	Yes	Yes
Pseudo fixed effects	No	Yes	No	Yes
Constant	-	-	6.233***	1.378*
			(0.814)	
Observations	371	357	369	369
R-squared^	0.056	0.086	0.086	0.378

Note: Robust standard errors in brackets

*** p<0.01. ** p<0.05. * p<0.1

^ Pseudo R-squared in columns (1) and (2)

(a) Statement 1 is the answer to the following question: Using a scale from 1 to 10 (1 means completely disagree. 10 means completely agree). provide your opinion on the following statement: "Competition is good. it stimulates people to work hard and develop new ideas".

(b) Statement 2 is the answer to the following question: Using a scale from 1 to 10 (1 means completely disagree. 10 means completely agree). provide your opinion on the following statement: "You can become rich only by damaging someone else"

Table 5 – Second stage estimates

Linear probability model for positionality; OLS for life satisfaction

VARIABLES	Positional on income		Life satisfaction	
	(1)	(2)	(3)	(4)
POSITIVE COMP	0.042	0.058	0.331**	0.303**
	(0.066)	(0.061)	(0.165)	(0.142)
NEGATIVE COMP	0.163**	0.133*	-0.253	-0.014
	(0.072)	(0.071)	(0.180)	(0.149)
millsp01	-0.189***	-0.151*	0.148	0.015
	(0.073)	(0.087)	(0.211)	(0.163)
millsp11	0.064	0.051	-0.020	0.037
	(0.042)	(0.042)	(0.114)	(0.096)
millsp21	0.027	0.020	-0.004	0.015
	(0.041)	(0.043)	(0.107)	(0.085)
Individual Controls	Yes	Yes	Yes	Yes
Pseudo fixed effects	No	Yes	No	Yes
Constant	-0.123	-0.166	7.787***	2.162**
	(0.392)	(0.431)	(1.219)	(1.178)
Observations	350	337	348	348
R-squared	0.109	0.148	0.070	0.379

Note: Bootstrapped standard errors in brackets (1000 replications)
*** p<0.01. ** p<0.05. * p<0.1

Table 6 – Estimates by gender

Marginal effects from probit estimates for positionality; OLS estimates for life satisfaction.

	Positional on income				Life satisfaction			
	Males		Females		Males		Females	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
POS INCOME					-0.001	0.012	-0.032	-0.039
					(0.212)	(0.174)	(0.177)	(0.143)
POSITIVE COMP	0.088	0.090	0.007	0.041	0.438	0.416*	0.209	0.166
	(0.107)	(0.110)	(0.080)	(0.082)	(0.295)	(0.226)	(0.179)	(0.155)
NEGATIVE COMP	0.149	0.107	0.169*	0.157*	-0.024	0.035	-0.420*	-0.024
	(0.112)	(0.113)	(0.089)	(0.091)	(0.255)	(0.217)	(0.225)	(0.185)
Individual Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Constant	-	-	-	-	7.931***	1.832*	7.057***	1.888*
					(0.734)	(1.063)	(1.121)	(1.119)
Observations	143	138	239	230	143	143	236	236
R-squared^	0.061	0.101	0.047	0.085	0.061	0.369	0.134	0.405

Note: Robust standard errors in brackets
*** p<0.01. ** p<0.05. * p<0.1
^ Pseudo R-squared in columns (1) and (2)

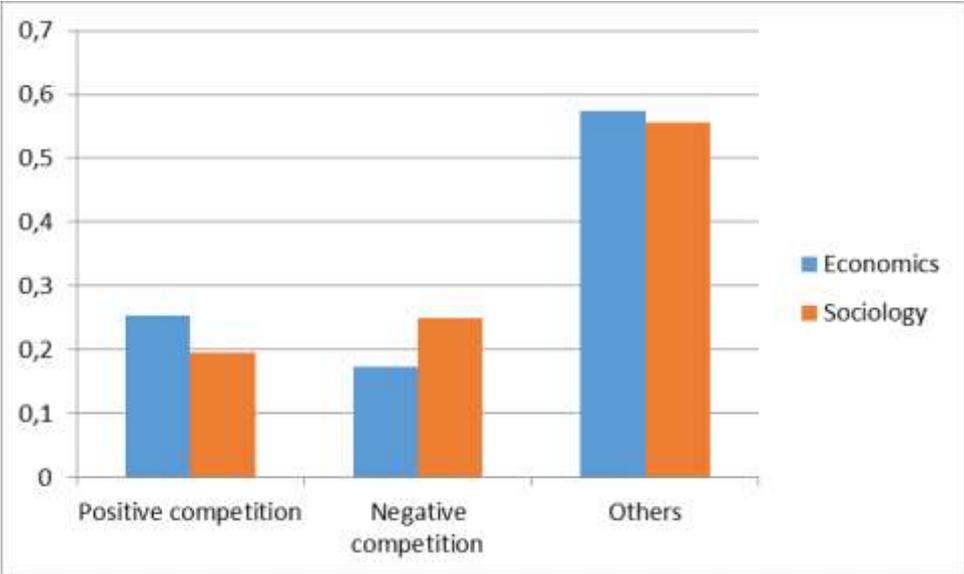**Figure 1 – Attitude to competition by department (%)**

Figure 2 – Happiness distribution by department and attitude to competition (%)

Appendix A

Table A1 - Definitions of the main control variables and basic statistics

Variables	Mean (st.dev.)
Female: 1 if female. 0 otherwise	0.622 (0.485)
Age: student age	20.52 (3.90)
Foreign: 1 if foreign-born. 0 otherwise	0.078 (0.269)
Marital status: 1 if married. 0 otherwise	0.098 (0.298)
Liceo: 1 if the student has a liceo diploma. 0 otherwise	0.504 (0.500)
Final grade: grade obtained in the final exam of the secondary school (on a 100-point scale)	77.57 (10.73)
No first year: 1 if not a freshman. 0 otherwise	0.053 (0.224)
Father's level of educ: 1 if the father has a high school diploma or higher. 0 otherwise	0.380 (0.486)
Mother's level of educ: if the mother has a high school diploma or higher. 0 otherwise	0.219 0.414)

Table A2 – Estimation results

Variables:	Dep. Variable: positional concerns on income		Dependent Variable: happiness	
Income			-0.008	-0.013
			(0.138)	(0.112)
Sociology	-0.248***	-0.209***	-0.182	-0.097
	(0.062)	(0.064)	(0.179)	(0.143)
POSITIVE COMP	0.025	0.044	0.303**	0.285**
	(0.063)	(0.065)	(0.157)	(0.130)
NEGATIVE COMP	0.149**	0.123*	-0.299*	0.013
	(0.069)	(0.071)	(0.173)	(0.143)
Female	0.062	0.041	-0.120	0.006
	(0.057)	(0.059)	(0.149)	(0.123)
Age	-0.001	-0.006	-0.014	-0.015
	(0.008)	(0.009)	(0.030)	(0.026)
Foreign	-0.064	-0.054	-0.317	0.021
	(0.109)	(0.120)	(0.272)	(0.225)
Marital status	-0.023	-0.046	0.186	0.042
	(0.097)	(0.107)	(0.246)	(0.188)
Liceo	0.044	0.029	-0.164	-0.175
	(0.056)	(0.059)	(0.145)	(0.114)
Final grade	0.0009	0.001	0.010	0.004
	(0.003)	(0.003)	(0.006)	(0.005)
No first year	0.051	0.035	-0.489*	-0.345
	(0.124)	(0.132)	4(0.286)	(0.261)
Father's level of educ	-0.013	-0.003	0.120	0.096
	(0.058)	(0.059)	(0.147)	(0.117)
Mother's level of educ	0.062	0.073	0.189	0.145
	(0.066)	(0.066)	(0.171)	(0.143)
Pseudo fixed effect (Score)		0.062***		
		(0.014)		
Pseudo fixed effect (Mean)				0.764***
				(0.065)
constant				1.859**
				(0.791)
obs	382	368	379	379

Note: robust standard errors in parenthesis. *. **. *** denote statistical significance at 10. 5. 1 percent level

Table A3 – Descriptive statistics by gender

	Males	Females
% POSITIVE COMP	0.227	0.246
% NEGATIVE COMP	0.187	0.197
% positional on income	0.470	0.486
Mean happiness	7.753	7.631
N obs	150	244

Positionality and life satisfaction by attitude to competition

	Males	Females
% positional on income		
POSITIVE COMP	0.5	0.4833
NEGATIVE COMP	0.5714	0.5744
Others	0.4253	0.4559
Mean happiness		
POSITIVE COMP	8.117	7.917
NEGATIVE COMP	7.464	7.229
Others	7.704	7.647

Appendix B: The Questionnaire (version A)

In this part of the questionnaire there are two hypothetical states of the world: A and B. For each situation choose the state you prefer. If you are undecided. circle both A and B. Note that prices are the same for all the persons in the society and in both situations. With the term "others" we mean the other people in the society.

1.
   A. Your current yearly income is €50.000; others earn €25.000
   B. Your current yearly income is €100.000; others earn €200.000
2.
   A. Your education level is a high school diploma (13 years of education); others' education level is a vocational school degree (11 years).
   B. Your education level is a bachelor degree (16 years); others' education level is a master's degree (18 years)
3.
   A. You have 2 weeks of vacation; others have 1 week
   B. You have 4 weeks of vacation; others have 8 weeks
4. Suppose that your intelligence might be estimated with an IQ test. The result of the test shows:
   A. Your IQ is 110; others' average is 90
   B. Your IQ is 130; others' average is 150
5. Assume physical attractiveness can be measured on a scale from 1 to 10 (1 is the lowest. 10 is the highest).
   A. Your physical attractiveness is 6; others' average is 4
   B. Your physical attractiveness is 8; others' average is 10
6. Suppose you have a child.
   A. Your child's education level is a high school diploma (13 years of education); other children's education level is a vocational school degree (11 years).
   B. Your child's education level is a bachelor degree (16 years); other children's education level is a master's degree (18 years)
7. Suppose you have a child
   A. Your child's IQ is 110; other children's average is 90
   B. Your child's IQ is 130; other children's average is 150
8. Suppose you have a child
   A. Your child's physical attractiveness is 6; other children's average is 4
   B. Your child's physical attractiveness is 8; other children's average is 10

9. Using a scale from 1 to 10 (where 1 means not at all satisfied, 10 means completely satisfied), choose your current level of satisfaction for the following items.

	1	2	3	4	5	6	7	8	9	10	don't know
Health	□	□	□	□	□	□	□	□	□	□	□
Study	□	□	□	□	□	□	□	□	□	□	□
Relationship with family members	□	□	□	□	□	□	□	□	□	□	□
Relationship with friends	□	□	□	□	□	□	□	□	□	□	□
Quantity of leisure	□	□	□	□	□	□	□	□	□	□	□
Quality of leisure	□	□	□	□	□	□	□	□	□	□	□

10. Using a scale from 1 to 10 (where 1 means not at all satisfied, 10 means completely satisfied), please rate, all things considered, how satisfied you are with your life as a whole these days.

1	2	3	4	5	6	7	8	9	10	don't know
□	□	□	□	□	□	□	□	□	□	□

11. Using a scale from 1 to 10 (1 means completely disagree. 10 means completely agree). provide your opinion on the following statements:

	1	2	3	4	5	6	7	8	9	10	don't know
Incomes should be less equal to incentivize individual effort	□	□	□	□	□	□	□	□	□	□	□
The state should take more responsibility to ensure that everyone is provided for	□	□	□	□	□	□	□	□	□	□	□
Competition is good. It stimulates people to work hard and develop new ideas	□	□	□	□	□	□	□	□	□	□	□
Working hard generally doesn't give success; it's only a question of luck and acquaintance	□	□	□	□	□	□	□	□	□	□	□
You can become rich only by damaging someone else	□	□	□	□	□	□	□	□	□	□	□