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of social closeness and relevance of reference groups
for positional concerns

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Abstract

We use an experimental approach to test if there is a link between positional preferences and the social *closeness* and *relevance* of the reference group. More specifically, we test if people are more positional when they compare with friends and colleagues, than when they compare to an anonymous person in society. We further test if the gender of the members in the reference group is important, and if positional preferences can be linked to an individual's *social identity*. To test our hypotheses, we randomize the reference groups across five unique domains – income, work performance, beauty, physical strength and social media popularity. Our results lend support to the hypothesis that social identification with a domain is correlated with positional concerns in that domain. However, in contrast to our hypotheses, we also find that a comparisons with an anonymous person in society trigger positional concerns among a significantly larger share of participants than do comparisons with friends or colleagues. Finally, our results indicate that both the gender of the participant and of the reference group has an effect on positional concerns.

Keywords: Positional concerns, positional preferences, social identity

JEL: D91

1. Introduction

Karoshi – the Japanese term for death from overwork, and *karojisatsu* – suicide due to mental stress arise from intense comparisons of work performance between colleagues (McAdams, 1992). How can performance at work be so important that it is worth dying for? Suppose that a colleague of yours starts to outperform you at work, e.g., publishing more papers in higher ranked journals than you do. How would you feel about this? Would you feel sheer joy over your colleague's success, or would you perhaps also feel the discomfort of a threatened self-esteem? What if the success belonged to a friend with a different occupation, rather than a colleague, would you still feel a bit conflicted? The questions asked in this paper revolve around with whom and about what we compare.

It is today widely acknowledged that many, if not most, people engage in social comparisons (Duesenberry, 1949; Easterlin, 1995; Frank, 2005). When an individual engage in social comparisons, and these comparisons affect her wellbeing, economists say that the individual has positional preferences (e.g. Aronsson & Johansson-Stenman, 2014; Carlsson, Gupta, & Johansson-Stenman, 2008). The link between relative consumption and utility is thought to emanate from a desire to gain, and maintain social status (Duesenberry, 1949; Veblen, 2005). Economists study positional preferences because such preferences give rise to negative externalities, and therefore cause market failures. More specifically, positional concerns are associated with an inefficient use of resources because they provide individuals with incentives to overinvest in behaviors that signal status (e.g. Alpizar, Carlsson, & Johansson-Stenman, 2005; Aronsson & Johansson-Stenman, 2008; Frank, 2005).

People display positional concerns for a range of behaviors and positional externalities can be relatively large. For example, Alpizar et al. (2005) find that about 45 percent of the increase in the utility of increased income stems from the increase in relative income. The degree of positionality varies over different types of goods and activities (henceforth referred to as domains). A general result in the literature is that visual status goods, such as houses and cars, are associated with a higher degree of positionality than less visual goods, e.g., time and public goods. (Alpizar et al., 2005; Carlsson, Johansson-Stenman, & Martinsson, 2007; Solnick & Hemenway, 1998). Personal characteristics, such as attractiveness and intelligence also appear to trigger relatively strong positional concerns (Hillesheim & Mechtel, 2011). Bogaerts and Pandelaere (2013) suggest that positional concerns are most likely to arise in domains, in which we need to compare with others in order to determine the value of the good or activity. These are important insights, which can help policy makers design corrective interventions that inefficiencies caused by positional preferences.

In this paper, we ask the question: Do people express more positional concerns when they compare with *socially close* and *relevant* others, and when the activity is an important part of a valued *social identity*?

Our research question is motivated by research in evolutionary and social psychology, which provide clues to the origin of positional preferences. Like all life on earth, humans compete over scarce resources in order to survive and to reproduce. Our ability to communicate, organize and live within social groups has provided humans, and other social animals, with an evolutionary advantage (Baumeister & Leary, 1995; Dunbar, 2003; Dunbar & Shultz, 2007; Kurland & Beckerman, 1985; Suls, Martin, & Wheeler, 2002). The memberships in valued

social groups define our *social identities* (e.g. Akerlof & Kranton, 2000; Leach et al., 2008; Stets & Burke, 2000; Tajfel, 2010). Most people are members of many social groups, and therefore have a wide range of social identities (e.g., being an *American, Woman, Economics professor, Mother, and Long-distance runner*). The relative importance of these different social identities vary from individual to individual (Leach et al., 2008). Within a social group, we measure our social acceptance and respect by our social status (Anderson, John, Keltner, & Krings, 2001), and with a higher social status, we increase our chances for survival and reproduction of our genes (Barkow et al., 1975; Barkow, Cosmides, & Tooby, 1992; Baumeister & Leary, 1995).

The evolutionary importance of social acceptance has created a link between our self-esteem and perceived changes in our social status. An individual experiences a threat to her social status, and therefore her self-esteem, if she receives information that her performance on a socially valued task falls below social expectations (Baumeister, Tice, & Hutton, 1989). The behaviors that provide social status depend on social norms, which can vary between different social groups. According to Tesser (1988), we mainly feel threatened when someone who is socially close and similar to us outperform us on something that is important to our self-image, i.e., when the behavior is closely linked to a central social identity. In line with this, previous research in psychology suggest that people tend to compare and compete with specific and close reference groups (e.g., friends), rather than general and distant others (e.g. Black, 2000; Lubbers, Kuyper, & Van Der Werf, 2009), and that Simon (1956) we often use the individuals closest to us as a proxy for information on our social performance (Lubbers et al., 2009; Suls et al., 2002).

Based on the above, we hypothesize that positional preferences stem from humans' strive to survive and reproduce, and from the evolutionary advantage that social group membership provides. If this hypothesis is correct, people will hold more positional concerns when they compare with a reference group that is socially *close*, and *relevant* for the behavior in question, and when the activity is associated with a valued social identity.

We further hypothesize that gender constitutes an important social identity for both men and women, and therefore that men and women will compete more with members of the same sex, than with members of the opposite sex, especially in gender stereotypical domains.

We analyze positional preferences in five domains - income, work, physical strength, beauty and social media followers, and use three general reference groups – society, colleagues and friends. *Society* represents a socially distant reference group, while *colleagues* and *friends* are socially close reference groups. Our colleagues resemble us in education and professional preferences. Their performance and income therefore provide us with a relatively good signal about our own work-related abilities. We therefore define *colleagues* as the domain relevant reference group for work performance and income. We socialize with our *friends* during leisure time, i.e., at the gym, at parties, and when we search for a mate. In addition, Lubbers et al. (2009) show that people intuitively use friends as a reference point. We therefore define friends as the domain relevant reference groups for social media followers, physical strength, and beauty. Finally, we use gender as an overarching reference group (e.g., male friends).

The five domains represent characteristics, which may be expected to be important for social status and for an individual's identity. Income and work performance are signals of an individual's ability to mass material resources, and to provide physical and material protection. Physical strength and beauty are signals of physical health and related to reproduction abilities. Social popularity is an indication of an individual's social abilities. Social media has become an increasingly important social space. Previous research suggest that social media use is at least partly driven by a need to belong and feel accepted (Nadkarni & Hofmann, 2012) and a desire to connect with new and old friends (Bonds-Raacke & Raacke, 2010). We therefore use social media followers as a proxy for social popularity.

Finally, previous research suggest that wealth and protective capacity constitute valuable characteristic for men, while beauty and friendliness are valued characteristics for women (Baumeister, Reynolds, Winegard, & Vohs, 2017; Bem, 1974; Buss, 1989; Eagly & Wood, 2016; Kenrick & Keefe, 1992; Udry & Eckland, 1984; Wiederman, 1993). We therefore expect that physical strength and beauty are closely linked to peoples' gender identity.

Our study contributes to the literature in at least three ways. First, we experimentally test if the social closeness and relevance of different reference groups affect the probability that an individual express positional concerns. A few existing studies have focused on how social closeness affect person wellbeing when comparing oneself to others (Clark & Senik, 2010; Frank, 2005; Luttmer, 2005). However, all these papers focus solely on income, and none of the studies use an experimental approach. We therefore do not know if there is a causal link between social closeness of the reference group and the degree of positionality, or if the relevant reference groups vary over domains. Second, we experimentally test for gender effects on positional preferences, and control for gender of the individual and the reference group. Most previous studies on positional concerns include gender as a control variable. However, to the best of our knowledge, no previous study explores if positional concerns can be linked to gender stereotypes, or if same-sex comparisons trigger more positional responses than between-sex comparisons. Finally, we evaluate if people are more prone to display positional concerns in domains that are associated with a valued social identity. Our analysis therefore contributes to an increased understanding of differences in positional preferences between different groups of individuals.

All three contributions have potentially important policy implications. If the social closeness and relevance of the reference group affects the degree of positionality, previous estimates of positional externalities may be erroneous. In addition, some forms of positional behaviors, like *Karoshi*, may have been missed all together. Our study makes a first attempt to identify relevant reference groups in different domains. We further shed light on individual heterogeneity in terms of social identification. This will help policy makers to identify key groups in different domains, and to design tailored policies that hold power to reduce the negative external effects associated with positional preferences.

The rest of the article is structured as followed: In section (2), we present our participants, measurement instruments, experimental design and statistical approach. Section (3) contains discussion of our results, and section (4) concludes.

2. Materials and Method

2.1 Hypotheses

We test if positional concerns are related to the social closeness and relevance of the reference group with five hypotheses, and the link between positional preferences and social identity with one hypothesis. In accordance with good research ethics, and to facilitate replication, we registered the study with open science framework (<https://osf.io/e93s2/>) prior to distribution of the survey.

H1. *People display more positional concerns when the reference group is socially close, than when it distant.* We use three overarching reference groups to test if *social closeness* affects the degree of positionality: average in society, colleagues and friends. We predict that people will be more positional when they compare with an average friend or colleague, than when they compare with an average person in society.

H2. *People display more positional concerns when the reference group is socially relevant for the activity at hand.* To test if there is a link between positional concerns and the relevance of the reference group, we use five domains - income, work performance, physical strength, beauty, and social media popularity. We predict that colleagues constitute the most relevant reference group for income and work performance, while friends are more relevant for physical strength, beauty and social popularity.

To test our hypothesis concerning men and women, we develop three hypotheses:

H3. *Men display more positional concerns in stereotypically male domains, **H4.** *Women display more positional concerns in stereotypically female,* and **H5.** *People display more positional concerns when they compare with others of the same sex, especially in gender stereotypical domains.* We predict that men will be more positional than women concerning income, work performance and physical strength, and that women will be more positional about beauty and social popularity than men are. We further predict that men (women) will display more positional preferences when they compare with other men (women), than when they compare with women (men) or when they compare with a gender-neutral other.*

Our last hypothesis concerns the link between positional preferences and social identity:

H6. *People display more positional concerns when the activity is linked to a social identity that is central to the individual's self-concept.* We use four social identities – Income, work performance, gender, and social popularity, and predict that the importance of each of these will vary between different individuals. We further predict that individuals, who feel that e.g., their work performance is an important part of who they are, will be more positional about their work performance than people who do not have a strong work identity.

2.2 Measurement instruments

2.2.1 Positional preferences

To operationalize positional preferences, we follow the approach used in previous studies (Carlsson et al., 2007; Solnick & Hemenway, 1998, 2005) and ask our respondents to imagine a situation where they can choose which world to live in. The participants are instructed to choose the alternative which would make them most happy, not evaluate the options with regard to what is best for others. In our experiment, participants choose between five alternatives. Alternative A represents the optimal choice if the participant only considers the absolute value of consumption. In this alternative, the individual has a higher level of

consumption than in all other alternatives, but less consumption than an average person in the reference group. In alternative B, the individual has a lower level of consumption than in alternative A, but relatively more than an average person in the reference group. Celse (2012) finds that a relatively large share of respondents displays inequality aversion. To control for this in, we include an egalitarian alternative, in which the individual has the same level of consumption as in alternative B, and the same level of consumption as the average person in the reference group. We control for violations of the non-satiation assumption (more is better) by a fourth alternative, in which the respondent is worse off both in absolute and relative terms in comparison to the other alternatives. Finally, we allow participants to answer that they are indifferent between alternatives, or that they cannot answer. An example question is provided below.

In the following questions, there are four states of the world.

You are asked to pick which of the four **you** would prefer to live in. You *should not* consider which society that is best on the whole. The questions are independent from each other. If you do not have a preference, choose 'I have no preference.'

Please note that, except for the factor described in each question, all states of the world are **completely identical**. The price level is equal to the current price level.

There are no 'right' or 'wrong' answers.

In which of these states of the world do you think that you would feel most satisfied?

- A. Your monthly wage before taxes is USD 6 300. In society, people on average earn USD 7 900.
- B. Your monthly wage before taxes is USD 5 100. In society, people on average earn USD 4 300.
- C. Your monthly wage before taxes is USD 5 100. In society, people on average earn USD 5 100.
- D. Your monthly wage before taxes is USD 5 100. In society, people on average earn USD 7 900.
- E. The difference between alternatives are not at all important to me

The values in alternative A and B makes it possible to calculate the marginal degree of positionality for a specified utility function. Most previous studies use either a ratio comparison utility function ($u_i = (x_i, x_i/\bar{x})$) or an additive comparison utility function ($u_i(x_i, x_i - \bar{x})$) (Carlsson et al., 2007), where x_i is the positional good or activity, and \bar{x} is the average in the reference group. In this study, we use the latter approach. Using a linear and additive comparison utility function allows us to calculate the marginal degree of positionality by the formula presented in equation (1)

$$\gamma = \frac{x_A - x_B}{\bar{x}_A - \bar{x}_B} \quad (1)$$

x_A and \bar{x}_A represent the value of consumption in alternative A for the individual and the average in the reference group, respectively. x_B and \bar{x}_B are the corresponding levels in alternative B (positional alternative). By this measure, we use the same formula as Alpizar et al. (2005), Carlsson et al. (2007) and Carlsson et al. (2008). We use a value of $\gamma = 0.33$ in all

choice experiments, and calibrate the values of the individual options such that the agent’s consumption level in the positional alternative (B) is 80 percent of the level in the absolute highest alternative (A). We define an individual as positional if she or he chooses alternative B, and non-positional any of the other alternatives are chosen.

To measure positional preferences for *income*, we use monthly income before taxes. To define a base level of income, we use the median monthly income for men aged mid 40s in the United States in 2019. To avoid loss aversion effects, we add 10 percent to this median (see QX in the appendix).

Assessing positional preferences for *work performance, physical strength, beauty and social popularity* is difficult for many reasons. These are all relatively abstract concepts, and all are inherently relative. In addition, the meaning of the different concepts can vary between professions, and between individuals. Previous research studying other characteristics that are difficult to quantify, e.g., physical attractiveness, fitness and praise by a supervisor (Celse, 2012; Solnick & Hemenway, 1998). Hillesheim and Mechtel (2013) use nominal scales and counts to measure the absolute value of a characteristic. We use a similar approach. More specifically, we use a nominal scale running from 1 to 100 for work performance, physical strength and beauty. To facilitate analysis, the values in each question are the same regardless of domain, and a value of 100 indicates the highest in the world (see QX-QY in the appendix). Finally, for social popularity, we use number of followers on social media. We have not been able to find data on the average number of followers on e.g., Instagram. To find a base level, we used that a micro-influencer is defined as a person who has at least 1,000 followers¹. The values we use in our choice experiments are summarized in *Table 1*, below.

Table 1. Values used in the choice experiments on positional preferences

Domain	Option	Self	Others	γ	Self/others	B/A
Income	A	6300	7900	0.33	0.80	0.81
	B	5100	4300			
	C	5100	5100			
	D	5100	7900			
Work perf.	A	52	65	0.33	0.80	0.81
	B	42	35			
	C	42	42			
	D	42	65			
Physical Strength	A	52	65	0.33	0.80	0.81
	B	42	35			
	C	42	42			
	D	42	65			
Beauty	A	52	65	0.33	0.80	0.81

¹ <https://www.cmswire.com/digital-marketing/social-media-influencers-mega-macro-micro-or-nano/>

	B	42	35			
	C	42	42			
	D	42	65			
Social media	A	800	1000	0.33	0.80	0.81
	B	650	550			
	C	650	650			
	D	650	1000			

2.2.2 Social identity

In this study, we use four social identities income, work performance, gender, and social popularity. To evaluate the relative importance of our these identities, we rely on a hierarchical model, developed Leach et al. (2008). The model has five different components sorted into two dimensions – self-definition and self-investment. These two components in the first dimension are *self-stereotyping* and *in-group homogeneity*, and the three components in the second dimension are *solidarity*, *satisfaction* and *centrality*. We are mainly interested in how important the group is for an individual’s self-concept, i.e., how central the social identity is to the individual’s personal identity. We therefore only use the *centrality* component, adapted from Cameron (2004) in an augmented version of the model by Leach et al. (2008).

For each of the four social identity domains, we asked the respondents to what degree they agreed with four statements (scale 1 = strongly disagree, to 6 = strongly agree) related to self-belonging (*I often think about the fact that I am a [...]*), self-identity (*the fact that I am a [...] is an important part of my identity*), and self-image (*Being a [...] is an important part of how I see myself*). To ensure that we capture the link between the social identity and self-esteem, we added a fourth question to the instrument: *How important are [...] for how you feel about yourself (your self-esteem)*. We used a scale from 1 (not at all important) to 6 (very important) for this question. The full set of social identity questions are available in the appendix (see QX-QZ).

2.3 Experimental design and sample

Our survey experiment has 9 treatments, which can be divided into two groups – social closeness and gender. The different treatments are depicted in *Table 2*, below.

Table 2. Experimental treatments

		Social closeness		
		Distant	Close	
		Society	Colleagues	Friends
Gender	Male	T1	T2	T3
	Female	T4	T5	T6
	No information	T7	T8	T9

We randomized all treatments across and within participants. This means that a participant might be asked to use the reference group “society” (T7) in one question, and “female friends” (T6) in another questions. Each participant answered one positionality question for each domain, i.e., in total five questions on positional concerns.

Participants first answered the five questions pertaining to positional preferences, and thereafter the set of questions measuring social identification. The sequences of all questions within each set (positionality and social identity) was randomized to avoid ordering effects. The last section of the survey contained socio-demographic questions. We designed the survey using the online platform lab.js. The survey experiment contained a total of 13 questions and took about 8 minutes to complete.

We recruited participants via Prolific Academics (N=2750). The participants were paid an hourly wage of GBP 7.5 to answer a survey. To ensure anonymity, we used JATOS to distribute the survey. Of the 2750 individuals who opened the survey, 2334 (85 percent) agreed to participate and provided valid information on country of residence. The vast majority of these participants reside in Europe (84 percent). Nearly 10 percent of the participants reside in North America, and about 5 percent in South America. Less than 2 percent reside in other world regions. About 50 percent of the participants held a university degree at the time of the survey.

Two-thousand and eighteen (73 percent) participants provided answers on all relevant questions in the survey, and defined themselves as either male or female. Of these, 1164 identified as male (57.7 percent) and 854 identified as female (42.3 percent). Mean age in the sample was 31 years (std = 10.61, min = 18, max =76). Thirty-six percent of the sample defined themselves as students. About 60 percent of the sample lived in small cities or rural areas (less than 300 thousand inhabitants), and 20.4 percent lived in large cities (over 1 million inhabitants). The median participant had a monthly gross income of USD 1001-2000.

3. Results

In this section we first provide an overview of the distribution of responses over all domains. In *section 3.2*, we present the results for the social closeness experiment (**H1**), and the relevance of the social domains (**H2**), followed by tests of hypotheses related to gender (**H3-H5**). We end the result section with an analysis of the relationship between social identity and positional concerns (**H6**).

3.1 Descriptive statistics

Table 3 display the responses for each domain, regardless of reference group treatment. In the choice experiments on income, work performance, physical strength and beauty, about one quarter to one third of participants chose alternative A (23- 27 percent) and B (Positional: 24 – 32 percent), respectively. In accordance with Celse (2012), a relatively large share (28 - 39 percent) stated that they preferred an equal distribution. Between 7 and 16 percent said that they were indifferent between alternatives, and a small share (2 – 5 percent) chose the inferior alternative. The distribution of answers to the choice experiment on social media followers is distinctly different. Only about 16 percent chose the positional answer, nearly 50 percent said that they were indifferent, and 8 percent preferred strictly fewer social media followers to more.

Table 3. Distribution of responses across domains

Domain	Absolute	Positional	Egalitarian	Indifference	Inferior
Income	27.40%	24.48%	38.80%	6.79%	2.53%
Work performance	23.34%	32.51%	34.79%	7.83%	1.54%
Physical strength	23.19%	27.85%	28.74%	15.71%	4.51%
Beauty	24.73%	26.26%	30.53%	15.06%	3.42%
Social media followers	12.98%	15.91%	15.91%	47.42%	7.79%

3.2 Effects of social closeness and relevance

To evaluate if the social closeness of the reference group affects positional concerns, we evaluate if the proportion of positional choices is higher when the reference group is defined as friends or colleagues as compared to society. As a first step, we disregard differences in information about gender. The results are presented in *Table 4*. In the table, *column 1* shows the proportion of participants who chose the positional answer when the reference group was defined as the average in society, and the total number of participants who were exposed to this treatment. *Column 2* and *3* present corresponding results for friends and colleagues, respectively. Finally, *columns 4 - 6* display differences and significance levels. We present the distribution of answers across all alternatives (absolute, positional, egalitarian and inferior) and reference groups in the appendix (*Table A1*).

Table 4. Effects of social closeness of the reference group on positional choices. Two-sided proportion tests. P-values in parentheses.

Domain	Share of positional choices			Differences		
	Distant (D)	Close (C)		D-C1	D-C2	C1-C2
	Society (D)	Friends (C1)	Colleagues (C2)			
Income	0.376 N=668	0.161 N=666	0.199 N=684	0.215 (<0.001)	0.177 (<0.001)	-0.038 (0.068)
Work performance	0.385 N=641	0.292 N=675	0.302 N=702	0.093 (<0.001)	0.083 (0.001)	-0.001 (0.680)
Beauty	0.328 N=650	0.196 N=663	0.264 N=698	0.132 (<0.001)	0.064 (0.010)	-0.068 (0.003)
Physical strength	0.345 N=646	0.243 N=723	0.251 N=649	0.102 (<0.001)	0.094 (<0.001)	-0.008 (0.740)
Social media followers	0.182 N=708	0.140 N=635	0.154 N=669	0.042 (0.037)	0.028 (0.162)	-0.014 (0.482)

Contrary to our hypothesis (H1), our results suggest that a larger share of individuals display positional concerns when the reference group is society than when the reference group is defined as friends or colleagues. With the exception of social media followers (comparison between society and colleagues), the differences are relatively large and significant. The results in Table 4 clearly reject the first hypothesis (H1) of our study.

Our main purpose for including egalitarian and inferior options was to ensure that we identify positional individuals. We therefore refrain from drawing any conclusions from the results in Table A1. However, it is interesting to note that a significantly larger proportion of participants choose the egalitarian option in the income and work performance domain when they compare with friends and colleagues. No such effect is found in the other domains.

To evaluate if people express more positional concerns when the reference group is relevant for the domain (H2), we compare the share of positional answers when the reference group is friends to the share when the reference group is defined as colleagues. We hypothesize that colleagues constitute a more relevant group than friends for income and work performance, and that friends are more relevant than colleagues for social media popularity, beauty and physical strength. However, as can be seen in column 6 in Table 4, we only find significant differences in the beauty and income domains. In addition, our results suggest that people are more positional when they compare their both their level of income and their beauty, to colleagues. In conclusion, we do not find support for the hypothesis that comparisons with colleagues and friends have heterogeneous effects on positional concerns in different domains.

3.3 Gender effects on positional preferences

In many domains, socially valued behavior and attributes differ between men and women. Our hypotheses are that men and women are more likely to express positional concerns in traditionally male and female domains, respectively (H3 and H4). We further hypothesize that comparisons with people of the same gender trigger more positional choices, than do comparisons with members of the opposite sex (H5).

The first columns in Table 5 and Table 6 present the proportion of men and women, respectively, who chose the positional alternative in the different domains. The right panel of the tables display differences across domains, and p-values from Wilcoxon signed-rank tests. The results in Table 5 and 6 disregards differences in effects due to differences in gender information, i.e., the results are based on the full sample of women and men.

Table 5. Proportion of positional choices and differences across domains, female participants. P-values from Wilcoxon signed rank tests in parentheses.

Domain	Share PP	Differences in proportions of positional answers			
		Income	Work	Phys	Beauty
Income	0.213				
Work performance	0.330	-0.117 (<0.001)			
Physical strength	0.169	0.044	0.161		

Beauty	0.255	(0.011)	(<0.001)	-0.042	0.075	-0.086
Social media followers	0.155	(0.021)	(<0.001)	0.058	0.175	0.014
		(<0.001)	(<0.001)	(0.396)		(0.100)
N obs	854					

Table 6. Proportion of positional choices and differences across domains, male participants. P-values from Wilcoxon signed rank tests in parentheses.

Domain	Share PP	Differences in proportions of positional answers			
		Income	Work	Phys	Beauty
Income	0.268				
Work performance	0.321	-0.053			
		(0.002)			
Physical strength	0.360	-0.092	-0.039		
		(<0.001)	(0.037)		
Beauty	0.268	0.000	0.053	0.092	
		(<0.001)	(0.001)	(<0.001)	
Social media followers	0.162	0.106	0.159	0.198	0.106
		(<0.001)	(<0.001)	(<0.001)	(<0.001)
N obs	1164				

As can be seen in *Table 5*, women in our sample express significantly more positional concerns for beauty (25.5 percent) than for physical strength (16.9 percent, $p<0.001$) or income (21.3 percent, $p=0.021$). By contrast, *Table 6* shows that men are significantly *less* positional about beauty (26.8 percent) than about physical strength (36.0 percent, $p<0.001$) or work performance (32.1 percent, $p=0.001$). A larger proportion of men are also positional about work performance than for social media followers (16.2 percent, $p<0.001$). However, we also find that a larger proportion of women chose the positional alternative in the work performance domain (33.0 percent) than in the beauty domain (25.5 percent, $p<0.001$), and we find no differences in the share of men who chose the positional alternative for income (26.8 percent) and beauty (26.8 percent).

Finally, while a larger proportion of men than women chose the positional alternative for income (Proportion test, $z=2.835$, $p=0.005$) and physical strength ($z=9.431$, $p<0.001$), we find no significant difference between men and women concerning work performance ($z=0.422$, $p=0.673$), beauty ($z=0.644$, $p=0.520$), or social media followers ($z=0.474$, $p=0.636$) or beauty. In conclusion, we find mixed results for hypotheses **H3** and **H4**.

Table 7 and *8* present the proportion of positional answers among men and women across domains and gender information treatments. Since information about the gender of the

referent others was randomized both between and within the participants, the number of observations differ between domains. We present the number of total observations in each treatment and domain below the individual results in the left panels of *Table 7* and *8*. We use Proportion tests to evaluate differences across treatments (right three panels). The full distribution of answers across alternatives and gender information treatments is available in *Tables A2* and *A3* in the appendix.

Table 7. Proportions of positional answers across domains and gender information treatments. Male participants. P-values from two sample proportion test in parenthesis

		Female (1)	Male (2)	No info (3)	Proportion tests		
					(1)-(2)	(1)-(3)	(2)-(3)
Income		0.155	0.318	0.301	-0.163	-0.146	0.017
	Total N	N=296	N=277	N=591	(<0.001)	(<0.001)	(0.623)
Work		0.236	0.340	0.358	-0.104	-0.122	-0.018
	Total N	N=284	N=279	N=601	(<0.001)	(<0.001)	(0.418)
Physical strength		0.435	0.398	0.304	0.037	0.131	0.094
	Total N	N=290	N=279	N=595	(0.376)	(<0.001)	(0.006)
Beauty		0.169	0.348	0.266	-0.179	-0.097	0.082
	Total N	N=267	N=319	N=576	(<0.001)	(0.002)	(0.010)
Social media followers		0.120	0.225	0.150	-0.105	-0.03	0.075
	Total N	N=299	N=315	N=546	(<0.001)	(0.232)	(0.005)

Table 8. Proportions of positional answers across domains and gender information treatments, female participants. P-values from two sample proportion test in parenthesis

		Female (1)	Male (2)	No info (3)	Proportion tests		
					(1)-(2)	(1)-(3)	(2)-(3)
Income		0.139	0.155	0.276	-0.016	-0.137	-0.121
	Total N	N=209	N=206	N=439	(0.633)	(<0.001)	(<0.001)
Work		0.233	0.251	0.418	-0.018	-0.185	-0.167
	Total N	N=215	N=211	N=428	(0.654)	(<0.001)	(<0.001)
Physical strength		0.226	0.130	0.157	0.096	0.069	-0.027
	Total N	N=226	N=207	N=421	(0.010)	(0.030)	(0.382)
Beauty		0.312	0.234	0.238	0.078	0.074	-0.004
	Total N	N=218	N=208	N=425	(0.073)	(0.043)	(0.929)
Social media followers		0.151	0.151	0.159	0.000	-0.008	-0.008
	Total N	N=218	N=219	N=415	(0.984)	(0.801)	(0.783)

Our hypothesis is that the share of positional answers from the female (male) subpopulation is higher when the reference group is of the same gender (**H5**). As can be seen in *Table 7*, men in our sample are significantly more likely to choose the positional alternative when the reference group is constituted by men than when it consists of women in all domains except physical strength ($p=0.376$). Within our female subsample, we find very few effects of gender information (*Table 8*). While our female participants are significantly more likely to express positional concerns for physical strength when they compare with other women than they are

when they compare with men ($p=0.01$), we only find marginally significant results in the beauty domain ($p=0.073$). We find no significant differences between male and female comparison groups for women concerning income, work performance or social media followers. Indeed, we find that both men and women are significantly less likely to express positional concerns when they compare with women than when they compare with a gender-neutral other for income (women: $p<0.001$, men: $p<0.001$) and work performance (women: $p<0.001$, men: $p<0.001$).

As can be seen in *Table A2* and *A3*, gender information about the reference group appears to affect the distribution of egalitarian answers in the domains: income, work and physical strength, and the distribution of inferior answers in the physical strength and beauty domains.

3.4 Positional concerns and social identification

Our last hypothesis, i.e., that people are more likely to be positional when the activity or consumption is central to their social identity (**H6**) changes the focus slightly compared to the other hypotheses. We create our measurement instruments for social identity by calculating factor scores from confirmatory factor analyses of the Leach et al. (2008) questions. *Table 11* shows descriptive statistics for the factor scores. All instruments has a Cronbach's alpha above 0.7, and a Keiser-Meyer-Olkin test-value above 0.7.

Table 11. Descriptive statistics for factor scores from confirmatory factor analysis

Social Identity Factor	Obs	Mean	Std. Dev.	Min	Max	KMO	Cronbach's alpha
Income	2018	0.000	0.870	-2.491	1.656	0.746	0.786
Work performance	2018	0.000	0.911	-2.417	1.344	0.773	0.819
Gender	2018	0.000	0.887	-2.246	1.338	0.704	0.746
Social Popularity	2018	0.000	0.947	-1.599	2.152	0.852	0.915

To test if the degree of social identification with a domain is associated with positional concerns in that domain, we run logistic regressions on each of our positionality variables (see *Table 12*). The dependent variables take the value one if the individual chose the positional alternative in the domain, and zero otherwise.

As can be seen in *Table 12*, our results suggest that individuals who identify relatively strongly with their income level are significantly more likely to choose the positional alternative in the experiment on income. None of the other identity variables predict positional preferences for income. Similarly, gender and social popularity are the sole identity variables that predict positionality for physical strength and followers on social media, respectively. However, we find no significant correlation between a strong work identity and positional concerns for work performance, or between gender and beauty. The last result is partly explained gender effects. *Table A3* and *A4* in the appendix show results from regressions on the female, and male subsample, respectively. The results suggests that women who feel that being a woman is a central part of their identity are more likely to be positional about beauty ($p=0.027$), but not about physical strength ($p = 0.927$). By contrast, men who identifies strongly as men are

more likely to be positional about physical strength ($0 < 0.001$), but not about beauty ($p = 0.550$).

Our study replicates findings in previous research: positional concerns are strongly correlated across domains, i.e., an individual who is positional about her income is also likely to be positional about her physical appearance. Finally, the results in *Table 12* show that the treatment effects of social closeness are robust to the inclusion of control variables. Individuals, who read about an average colleague or friend or colleague, are significantly less positional than individuals, who read about an average person in society.

Table 12. Correlates of positional concerns. Logistic regression. Standard errors in parentheses.

	Income	Work	Physical Strength	Beauty	SoMe
Positional preferences					
Income		0.508*** (0.116)	0.513*** (0.122)	0.588*** (0.122)	0.668*** (0.140)
Work performance	0.492*** (0.119)		0.509*** (0.115)	0.837*** (0.112)	0.100 (0.138)
Phys. Strength	0.474*** (0.126)	0.527*** (0.115)		0.690*** (0.120)	0.742*** (0.141)
Beauty	0.565*** (0.126)	0.811*** (0.113)	0.705*** (0.120)		0.681*** (0.139)
SoMe	0.711*** (0.147)	0.104 (0.139)	0.726*** (0.142)	0.693*** (0.140)	
Social identity factors					
Income	0.433*** (0.084)	0.059 (0.073)	0.038 (0.079)	0.017 (0.080)	-0.095 (0.097)
Work performance	-0.140 (0.072)	0.040 (0.064)	-0.109 (0.069)	-0.069 (0.070)	0.076 (0.085)
Gender	-0.039 (0.075)	-0.031 (0.066)	0.242*** (0.071)	0.128 (0.073)	-0.084 (0.088)
Social popularity	0.012 (0.069)	0.042 (0.062)	0.004 (0.066)	0.142* (0.068)	0.557*** (0.082)
Socio-demographics					
Income (log)	0.171** (0.062)	0.074 (0.055)	-0.007 (0.059)	-0.057 (0.060)	0.005 (0.071)
Female	-0.148 (0.124)	0.249* (0.109)	-1.156*** (0.122)	0.086 (0.119)	0.248 (0.142)
Age	-0.012* (0.006)	-0.008 (0.005)	-0.008 (0.006)	-0.010 (0.006)	-0.013 (0.007)
Close-Distant comparison (ref is society)					
Colleagues	-0.924*** (0.128)	-0.323** (0.122)	-0.473*** (0.134)	-0.338** (0.129)	-0.172 (0.154)
Friends	-1.313*** (0.156)	-0.404** (0.123)	-0.500*** (0.130)	-0.700*** (0.137)	-0.260 (0.160)
Gender information (ref is no information)					
Female	-0.856*** (0.153)	-0.781*** (0.130)	0.629*** (0.129)	-0.164 (0.140)	-0.246 (0.167)
Male	-0.193 (0.137)	-0.426*** (0.124)	0.196 (0.136)	0.279* (0.129)	0.244 (0.151)
Constant	-1.749*** (0.458)	-1.176** (0.409)	-0.823 (0.435)	-0.899* (0.441)	-2.120*** (0.534)
N	2018	2018	2018	2018	2018
Chi-square	328.820	206.600	316.346	275.650	202.145
Pseudo r-square	0.146	0.081	0.133	0.119	0.114

*** p<0.01, **p<0.05, * p<0.1

4. Discussion and implications for future research

The main focus of this study was to test if positional preferences are affected by the social *closeness* and *relevance* of the reference group. We further wanted to investigate if people are more positional in domains, which are linked to a valued social identity. To test our hypotheses, we implemented a hypothetical choice experiment on a sample of 2 750 (2 018 complete responses) participants recruited via Prolific Academics. We randomized social closeness (society, colleagues, and friends) and gender information (male, female, and no gender information) across all hypothetical choice experiments. In summary, our results suggest that social closeness and the gender of the reference group matter. However, the effect appears to go in the opposite direction from expected.

Our results suggest that people are more likely to express positional preferences when they compare with an average person in society, than when they compare with a colleague or a friend, regardless of gender. Similarly, although men appear to compete more with other men in most domains, we find that both men and women are more likely to express positional concerns when the reference group is constituted by a gender-neutral other than when it is defined as female, especially concerning income and work performance. We find no evidence that the two socially close reference groups - colleagues and friends, have different effects on positional concerns. Taken together, this may indicate that socially close reference groups, consisting of people that we care about, may trigger altruistic preferences by making the situation less abstract and more relatable. Our data suggests that socially close reference groups may trigger egalitarian choices, at least in some domains. For future research, it might therefore prove fruitful to investigate egalitarian preferences more carefully. It is also possible that the overlap between colleagues and friends affected our results. Colleagues can be friends and vice versa. It may prove fruitful to use more distinct domains and reference groups (e.g., performance in a sport and others who are active in the sport).

Turning to the role of social identity, we find support for the hypothesis that positional concerns for income, physical strength and social media followers are linked to social identification with these domains. However, individuals who considers performance at work and beauty as important parts of their identity are no more likely to express positional concerns than individuals who deem these aspects to be unimportant. Concerning beauty, the lack of effect is partly explained by gender. We find a significant correlation between social identification as a woman and positional concerns for beauty, but no effect for men. Concerning work performance, we find no effect regardless of the gender of the participant. This is especially interesting because so many individuals express positional concerns for work. A potential area for future research is therefore to test if increased identification with the workplace may actually reduce the problem with positional overwork.

Our study design has several limitations, and our results raises more questions than they provide answers. However, to the best of our knowledge, this is the first study focusing on the importance of reference groups across multiple domains. With our approach we show that the reference group and social identity matter for positional preferences. Our results further suggest that men and women react differently to information about the gender of the reference group. We hope that this study can work as a stepping stone, and that future research will shed light on the mechanisms behind our findings.

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Appendices

A.1. Survey measures

A1.1. Positionality domains

A1.1.1. Income

The alternatives represent monthly income before tax.

In which of these states of the world do you think that you would feel most satisfied?

- A. **Your** monthly wage before taxes is **USD 4 500**. $\$(parameters.t1)$ earn on average **USD 5 200**.
- B. **Your** monthly wage before taxes is **USD 4000**. $\$(parameters.t1)$ earn on average **USD 3 700**.
- C. **Your** monthly wage before taxes is **USD 4 000**. $\$(parameters.t1)$ earn on average **USD 4 000**.
- D. **Your** monthly wage before taxes is **USD 4 000**. $\$(parameters.t1)$ earn on average **USD 5 200**.
- E. The differences between alternatives are not at all important to me.
- F. I don't want to answer

A.1.1.2 Work performance

Suppose that it is possible to measure work performance on a scale running from 0 to 100, where 100 is the highest work performance in the world. A high work performance can for example represent high production output or lack of errors. Assume that you face no risk of losing your job.

In which of these states of the world do you think that you would feel most satisfied?

- A. **Your** performance at work corresponds to **60** on the scale. $\$(parameters.t1)$ ' work performance on average corresponds **90** on the same scale.
- B. **Your** performance at work corresponds to **40** on the scale. $\$(parameters.t1)$ ' work performance on average corresponds **30** on the same scale.
- C. **Your** performance at work corresponds to **40** on the scale. $\$(parameters.t1)$ ' work performance on average corresponds **40** on the same scale.
- D. **Your** performance at work corresponds to **40** on the scale. $\$(parameters.t1)$ ' work performance on average corresponds **90** on the same scale.
- E. The differences between alternatives are not at all important to me.
- F. I don't want to answer

A.1.1.3 Beauty

Suppose that it is possible to measure beauty on a scale running from 0 to 100, where 100 is the highest beauty in the world. A high beauty can for example represent symmetrical facial features.

In which of these states of the world do you think that you would feel most satisfied?

- A. **Your** beauty corresponds to **60** on the scale. $\$(parameters.t1)$ ' beauty on average corresponds **90** on the same scale
- B. **Your** beauty corresponds to **40** on the scale. $\$(parameters.t1)$ ' beauty on average corresponds **30** on the same scale
- C. **Your** beauty corresponds to **40** on the scale. $\$(parameters.t1)$ ' beauty on average corresponds **40** on the same scale
- D. **Your** beauty corresponds to **40** on the scale. $\$(parameters.t1)$ ' beauty on average corresponds **90** on the same scale
- E. The differences between alternatives are not at all important to me.
- F. I don't want to answer

A.1.1.4 Physical strength

Suppose that it is possible to measure physical strength on a scale running from 0 to 100, where 100 is the highest physical strength in the world. A high physical strength can for example represent the ability to lift heavy weights.

In which of these states of the world do you think that you would feel most satisfied?

- A. **Your** physical strength corresponds to **60** on the scale. $\$(parameters.t1)$ ' physical strength on average corresponds **90** on the same scale
- B. **Your** physical strength corresponds to **40** on the scale. $\$(parameters.t1)$ ' physical strength on average corresponds **30** on the same scale
- C. **Your** physical strength corresponds to **40** on the scale. $\$(parameters.t1)$ ' physical strength on average corresponds **40** on the same scale
- D. **Your** physical strength corresponds to **40** on the scale. $\$(parameters.t1)$ ' physical strength on average corresponds **90** on the same scale
- E. The differences between alternatives are not at all important to me.
- F. I don't want to answer

A.1.1.5 Social media followers

Suppose that you have access to information on how many followers people have on social media accounts, such as for example Instagram and Twitter.

In which of these states of the world do you think that you would feel most satisfied?

- A. You have **800** followers on your main social media account. $\$(parameters.t1)$ on average have **1000** followers on their main social media account.
- B. You have **650** followers on your main social media account. $\$(parameters.t1)$ on average have **550** followers on their main social media account.
- C. You have **650** followers on your main social media account. $\$(parameters.t1)$ on average have **650** followers on their main social media account.
- D. You have **650** followers on your main social media account. $\$(parameters.t1)$ on average have **1000** followers on their main social media account.
- E. The differences between alternatives are not at all important to me.
- F. I don't want to answer

$[\$(parameters.t1)$

Randomized between participants. T1 remains constant within a question (e.g., income) but varies between questions, i.e., a single participant can answer question where the reference group is 'friends' concerning income, and 'female colleagues' concerning beauty.

- Your friends
- Your colleagues
- Your female friends
- Your male friends
- Your female colleagues
- Your male colleagues
- In society, people
- In society, females
- In society, males]

A.1.2 Social identity

A.1.2.1 Self belonging

To what extent do you agree with the following statements? (1 = strongly disagree, 6 = strongly agree, NA = no answer)

- I often think about the fact that I am a **[your profession]**
- I often think about the fact that I belong to a certain **income group**
- I often think about the fact that I am a **[your gender]**
- I often think about the fact that I have a certain level of **social popularity**

A.1.2.2 Self identity

To what extent do you agree with the following statements? (1 = strongly disagree, 6 = strongly agree, NA = no answer)

- The fact that I am a **[your profession]** is an important part of my identity
- The fact that I belong to a certain **income group** is an important part of my identity
- The fact that I am a **[your gender]** is an important part of my identity
- The fact that I have a certain level of **social popularity** is an important part of my identity

A.1.2.3 Self image

To what extent do you agree with the following statements? (1 = strongly disagree, 6 = strongly agree, NA = no answer)

- Being a **[your profession]** is important for how I see myself
- Having a certain **level of income** is important for how I see myself
- Being a **[your gender]** is important for how I see myself
- Having a certain level of **social popularity** is important for how I see myself

A.1.2.4 Self confidence

How important are the following things for how you feel about yourself (your self-esteem)? (1 = not important at all, 6 = very important, NA = no answer)

- Your performance at **work**
- Your level of **income**
- Your level of **physical attractiveness**
- Your level of **social popularity**

A.2. Tables

Table A1: share of answers – all categories. Reference groups

Domain	Share of positional choices			Differences and Proportion tests					
	Distant	Close		D-C1		D-C2		C1-C2	
	Society (D)	Friends (C1)	Colleagues (C2)	Diff.	p-value	Diff.	p-value	Diff.	p-value
Income	668	533	817						
Absolute	0.232	0.330	0.272	-0.098	<0.001	-0.040	0.080	0.058	0.021
Positional	0.376	0.150	0.200	0.226	<0.001	0.176	<0.001	-0.049	0.021
Egalitarian	0.302	0.422	0.436	-0.120	<0.001	-0.133	<0.001	-0.014	0.622
Inferior	0.033	0.026	0.018	0.007	0.501	0.015	0.073	0.008	0.327
Work performance	641	675	702						
Absolute	0.215	0.249	0.235	-0.034	0.149	-0.020	0.387	0.014	0.549
Positional	0.385	0.292	0.302	0.093	<0.001	0.083	0.001	-0.010	0.681
Egalitarian	0.307	0.361	0.372	-0.054	0.038	-0.064	0.013	-0.010	0.691
Inferior	0.023	0.012	0.011	0.012	0.110	0.012	0.090	0.000	0.937
Physical strength	646	723	649						
Absolute	0.212	0.245	0.237	-0.033	0.150	-0.025	0.277	0.008	0.745
Positional	0.345	0.243	0.251	0.102	<0.001	0.094	<0.001	-0.008	0.741
Egalitarian	0.263	0.302	0.296	-0.038	0.116	-0.033	0.190	0.006	0.818
Inferior	0.053	0.043	0.040	0.010	0.397	0.013	0.282	0.003	0.794
Beauty	657	663	698						
Absolute	0.199	0.293	0.249	-0.093	<0.001	-0.050	0.028	0.043	0.072
Positional	0.329	0.196	0.264	0.133	<0.001	0.065	0.009	-0.068	0.003
Egalitarian	0.286	0.321	0.308	-0.035	0.165	-0.022	0.379	0.013	0.599
Inferior	0.044	0.029	0.030	0.015	0.133	0.014	0.170	-0.001	0.876
Social media followers	714	635	669						
Absolute	0.115	0.148	0.129	-0.033	0.071	-0.014	0.436	0.019	0.308
Positional	0.181	0.140	0.154	0.041	0.044	0.027	0.184	-0.014	0.482
Egalitarian	0.143	0.156	0.179	-0.013	0.502	-0.037	0.065	-0.023	0.257
Inferior	0.081	0.063	0.088	0.018	0.198	-0.007	0.642	-0.025	0.086

Table A2. Share of answers – all categories. Gender information – female subsample

	Proportion tests								
	Female	Male	No info	Female - Male	Female- no info	Male - no info			
	(1)	(2)	(3)	(1)-(2)	p-value	(1)-(3)	p-value	(2)-(3)	p-value

Income	N	296	277	591						
	Absolute	0.304	0.325	0.354	-0.021	0.5909	-0.050	0.1407	-0.029	0.4064
	Positional	0.155	0.318	0.301	-0.162	0.0000	-0.146	0.0000	0.017	0.6230
	Egalitarian	0.439	0.231	0.261	0.208	0.0000	0.179	0.0000	-0.030	0.3497
	Inferior	0.020	0.029	0.036	-0.009	0.5047	-0.015	0.2121	-0.007	0.6112
Work	N	284	279	601						
	Absolute	0.289	0.287	0.265	0.002	0.9583	0.024	0.4508	0.022	0.4912
	Positional	0.236	0.330	0.358	-0.094	0.0134	-0.122	0.0003	-0.028	0.4176
	Egalitarian	0.331	0.301	0.295	0.030	0.4454	0.036	0.2717	0.007	0.8427
	Inferior	0.011	0.018	0.022	-0.007	0.4608	-0.011	0.2487	-0.004	0.7175
Physical strength	N	290	279	595						
	Absolute	0.186	0.226	0.274	-0.040	0.2427	-0.088	0.0044	-0.048	0.1297
	Positional	0.434	0.398	0.304	0.037	0.3756	0.130	0.0001	0.094	0.0062
	Egalitarian	0.169	0.265	0.252	-0.096	0.0053	-0.083	0.0054	0.013	0.6785
	Inferior	0.021	0.025	0.039	-0.004	0.7255	-0.018	0.1588	-0.014	0.3045
Beauty	N	267	321	576						
	Absolute	0.401	0.262	0.280	0.139	0.0003	0.121	0.0004	-0.018	0.5656
	Positional	0.169	0.355	0.266	-0.187	0.0000	-0.097	0.0020	0.090	0.0049
	Egalitarian	0.221	0.234	0.280	-0.013	0.7153	-0.059	0.0718	-0.046	0.1348
	Inferior	0.060	0.028	0.043	0.032	0.0564	0.017	0.2995	-0.015	0.2480
Social media	N	299	315	550						
	Absolute	0.207	0.117	0.133	0.090	0.0025	0.075	0.0045	-0.015	0.5166
	Positional	0.120	0.225	0.149	-0.105	0.0006	-0.029	0.2484	0.076	0.0047
	Egalitarian	0.120	0.133	0.138	-0.013	0.6305	-0.018	0.4646	-0.005	0.8415
	Inferior	0.104	0.083	0.091	0.021	0.3670	0.013	0.5452	-0.008	0.6757

Table A3. Share of answers – all categories. Gender information – male subsample

		Proportion tests								
		Female	Male	No info	Female - Male		Female- no info		Male - no info	
		(1)	(2)	(3)	Diff	p-value	Diff	p-value	Diff	p-value
Income	N	209	206	439						
	Absolute	0.244	0.117	0.203	0.128	0.0007	0.041	0.2326	-0.086	0.0072
	Positional	0.139	0.155	0.276	-0.017	0.6333	-0.137	0.0001	-0.120	0.0008
	Egalitarian	0.512	0.680	0.428	-0.168	0.0005	0.084	0.0455	0.251	0.0000
	Inferior	0.029	0.015	0.016	0.014	0.3226	0.013	0.2788	-0.001	0.8946
Work	N	215	211	428						

	Absolute	0.209	0.142	0.175	0.067	0.0690	0.034	0.2955	-0.033	0.2890
	Positional	0.233	0.251	0.418	-0.019	0.6535	-0.186	0.0000	-0.167	0.0000
	Egalitarian	0.414	0.512	0.350	-0.098	0.0427	0.063	0.1160	0.161	0.0001
	Inferior	0.014	0.019	0.007	-0.005	0.6846	0.007	0.3876	0.012	0.1724
Physical strength	N	226	207	421						
	Absolute	0.155	0.329	0.202	-0.174	0.0000	-0.047	0.1423	0.127	0.0005
	Positional	0.226	0.130	0.157	0.095	0.0100	0.069	0.0300	-0.026	0.3824
	Egalitarian	0.425	0.256	0.375	0.169	0.0002	0.049	0.2191	-0.119	0.0029
	Inferior	0.049	0.121	0.045	-0.072	0.0066	0.004	0.8382	0.076	0.0005
Beauty	N	218	211	425						
	Absolute	0.142	0.166	0.191	-0.024	0.4968	-0.048	0.1257	-0.025	0.4473
	Positional	0.312	0.232	0.238	0.080	0.0639	0.074	0.0428	-0.005	0.8795
	Egalitarian	0.358	0.370	0.388	-0.012	0.7983	-0.030	0.4511	-0.019	0.6500
	Inferior	0.018	0.024	0.024	-0.005	0.6992	-0.005	0.6700	0.000	0.9896
Social media	N	218	219	417						
	Absolute	0.128	0.091	0.101	0.037	0.2147	0.028	0.2896	-0.009	0.7043
	Positional	0.151	0.151	0.158	0.001	0.9839	-0.007	0.8200	-0.008	0.8020
	Egalitarian	0.183	0.242	0.177	-0.059	0.1350	0.006	0.8509	0.065	0.0530
	Inferior	0.073	0.018	0.072	0.055	0.0058	0.001	0.9466	-0.054	0.0042

Table A4. Correlates of positional preferences. Logistic regression. Female subsample.

	Income	Work	Phys Strength	Beauty	SoMe
Positional preferences					
Income		0.691*** (0.193)	0.563* (0.221)	0.783*** (0.197)	0.669** (0.229)
Work performance	0.656*** (0.193)		0.728*** (0.198)	0.657*** (0.177)	-0.277 (0.227)
Phys. Strength	0.479* (0.227)	0.796*** (0.203)		0.457* (0.214)	0.576* (0.246)
Beauty	0.757*** (0.203)	0.654*** (0.181)	0.435* (0.215)		0.975*** (0.215)
SoMe	0.768** (0.240)	-0.242 (0.227)	0.576* (0.250)	1.005*** (0.218)	
Social identification					
Income	0.544*** (0.134)	-0.096 (0.112)	0.026 (0.136)	-0.073 (0.121)	-0.161 (0.149)
Work performance	-0.254* (0.112)	0.172 (0.112)	-0.065 (0.136)	-0.023 (0.121)	-0.014 (0.149)

	(0.110)	(0.095)	(0.115)	(0.102)	(0.127)
Gender	-0.197	-0.002	0.012	0.266*	-0.292*
	(0.130)	(0.108)	(0.132)	(0.121)	(0.146)
SoMe	0.095	0.110	-0.085	0.153	0.705***
	(0.116)	(0.101)	(0.124)	(0.108)	(0.135)
Socio-demographics					
Income (log)	0.205*	0.198*	0.127	-0.156	0.055
	(0.104)	(0.089)	(0.108)	(0.098)	(0.116)
Age	-0.010	-0.012	-0.017	-0.005	-0.021*
	(0.009)	(0.008)	(0.010)	(0.008)	(0.010)
Close-Distant comparison (ref is society)					
Colleagues	-0.762***	-0.316	-0.499*	-0.304	-0.156
	(0.208)	(0.190)	(0.236)	(0.197)	(0.239)
Friends	-1.211***	-0.579**	-0.457*	-0.628**	-0.384
	(0.257)	(0.194)	(0.232)	(0.215)	(0.257)
Gender information (ref is no information)					
Female	-0.867***	-0.954***	0.516*	0.356	-0.090
	(0.247)	(0.201)	(0.220)	(0.201)	(0.250)
Male	-0.809***	-0.779***	-0.173	-0.063	-0.135
	(0.243)	(0.196)	(0.257)	(0.216)	(0.249)
Constant	-2.290**	-1.530*	-2.475**	-0.381	-1.800*
	(0.753)	(0.635)	(0.785)	(0.688)	(0.839)
N	854	854	854	854	854
Chi-square	146.956	110.263	67.525	111.453	91.919
Pseudo r-square	0.166	0.102	0.087	0.115	0.125

Table A5. Correlates of positional preferences. Logistic regression. Female subsample.

	Income	Work	Phys Strength	Beauty	SoMe
Positional preferences					
Income		0.413**	0.492***	0.448**	0.647***
		(0.150)	(0.149)	(0.159)	(0.181)
Work performance	0.391*		0.354*	1.000***	0.391*
	(0.155)		(0.144)	(0.150)	(0.180)
Phys. Strength	0.529***	0.348*		0.878***	0.837***
	(0.155)	(0.143)		(0.151)	(0.178)
Beauty	0.487**	0.926***	0.866***		0.451*
	(0.163)	(0.147)	(0.149)		(0.185)
SoMe	0.664***	0.360*	0.831***	0.465*	
	(0.188)	(0.178)	(0.178)	(0.188)	
Social identification					
Income	0.361***	0.153	0.055	0.046	-0.047
	(0.109)	(0.099)	(0.098)	(0.109)	(0.130)

Work performance	-0.036 (0.097)	-0.072 (0.089)	-0.160 (0.089)	-0.046 (0.098)	0.197 (0.119)
Gender	0.024 (0.093)	-0.021 (0.085)	0.333*** (0.085)	0.056 (0.094)	-0.006 (0.115)
SoMe	-0.032 (0.087)	0.022 (0.080)	0.054 (0.080)	0.140 (0.088)	0.465*** (0.105)
Socio-demographics					
Income (log)	0.175* (0.078)	-0.004 (0.072)	-0.071 (0.071)	0.007 (0.079)	0.004 (0.091)
Age	-0.015 (0.008)	-0.004 (0.007)	-0.005 (0.007)	-0.016 (0.008)	-0.011 (0.009)
Close-Distant comparison (ref is society)					
Colleagues	-1.030*** (0.166)	-0.349* (0.162)	-0.454** (0.165)	-0.400* (0.175)	-0.232 (0.206)
Friends	-1.377*** (0.197)	-0.306 (0.164)	-0.522** (0.159)	-0.818*** (0.183)	-0.169 (0.208)
Gender information (ref is no information)					
Female	-0.834*** (0.197)	-0.632*** (0.173)	0.672*** (0.161)	-0.640** (0.204)	-0.341 (0.227)
Male	0.163 (0.173)	-0.197 (0.163)	0.356* (0.164)	0.504** (0.167)	0.504** (0.194)
Constant	-1.682** (0.578)	-0.799 (0.529)	-0.469 (0.523)	-1.195* (0.577)	-2.288*** (0.685)
N	1164	1164	1164	1164	1164
Chi-square	195.953	119.343	176.031	202.080	132.664
Pseudo r-square	0.145	0.082	0.116	0.149	0.128