UiT The Arctic University of Norway

Faculty of Bioscience, Fisheries and Economics

POSITIONAL CONCERNS

How and why, and with what effect, are we positional when comparing with those around us?

Ingvild Mageli

A dissertation for the degree of Philosophiae Doctor, January 2022

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Abstract

With this thesis, we focused on positional preferences. We took an experimental approach to study what may contribute to such behavior, and what effect these choices have on individual wellbeing. We used three independent surveys to analyze this, all three measuring positional preferences in a broad spectrum of domains. If left uncorrected, there might be large unintended external effects from positional preferences, which is why this research is necessary. On a greater scale, we can use this understanding as a tool to design a policy instrument correcting for the suboptimal behavior when people are concerned with relative performance. Our first study focused on the effect of gender, closeness, and relevance of the reference group (with whom we compare) on positional preferences and we explored how social identification in the relevant domains contributes to such behavior. The focus of our second study was to test if the instruments commonly used in this research are robust to a variation in levels (endowment) or subject (deciding for the self or deciding for a grandchild). Finally, our third study focused on the effects of positional preferences on life satisfaction. To test our hypotheses we ran a set of logistic regressions, controlling for a variety of social-demographic indicators. Our findings suggest that comparing with an average in society elicits a higher share of positional preferences than comparing with someone close and relevant, and we found that social identification with a domain correlates with positional preferences in the same domain. We also found that gender of the individual, and the reference group matter for positional preferences in some domains, but not all domains are gendered. When we tested the robustness of these instruments, we found that they are relatively insensitive to a variation in levels and in the targeted subject, which is reassuring as it validates earlier findings and makes them replicable. Finally, our third study suggests that positionality in all the included domains has negative and significant effects on how we feel about ourselves.

Acknowledgment

List of papers

Name of candidate: Ingvild Mageli

Papers
The following papers are included in my Ph.D thesis:

I: Mageli, I, Mannberg, A & Heen, E. Who compares to whom? The effect of social identity and reference groups on positional preferences. Conditionally accepted December 22nd 2021 in *Journal of behavioral and experimental economics*.

II: Mageli, I. Levels and subject. Are reference levels and targeted subject important for positional preferences? Under revision *Journal of behavioral and experimental economics*.

III: Positional concerns and life satisfaction. Does your satisfaction with life increase when you are relatively better off than those around you are? – advanced manuscript

Contributions (co-author statements)

	Paper I	Paper II	Paper III
Idea	IM	IM	IM
Concept	IM, AM, EH	IM	IM
Data preparation	IM, AM, EH	IM, AM	IM
Data collection	IM, AM, EH	IM, AM	IM, AM
Analysis	IM, AM	IM	IM, AM
First draft	IM, AM	IM	IM
Rewriting and edits	IM, AM, EH	IM, AM	IM, AM
Revise and resubmit (if applicable)	IM, AM, EH	IM, AM	
Presentation	IM	IM	IM

IM = Ingvild Mageli
AM = Andrea Mannberg
EH = Eirik Heen

Other declarations

Conflict of interest: none

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1. Introduction

The economic man – *homo economicus*, cares only about his gains and his individual utility. He only acts in the interest of himself, never with care for the world around him. However, most of us are not the economic man, and we do indeed care for those around us. When we assess something, we are often incapable of evaluating the value without a point of reference. We need a proxy or a threshold for comparison (Suls et al., 2002). When we want to attain value to something, we need a point of reference in our decision-making.

In all aspects of life, we compete and compare with those around us. Our performance in the social game is, to a various extent dependent on our social standing (Duesenberry, 1949; Easterlin, 1995; Frank, 1985). The strive for wealth and possessions drives human behavior, through conspicuous consumption because we want to signal our success (Veblen, 1899). We assess if our wage is good enough by looking at numbers for those with similar jobs or education. When we buy a home, we want to know if our purchase was a bargain by paying less for similarly valuable property. If we partake in sports, we want to jump the highest or run the fastest of those in our heat. Although social comparison arguably has positive side effects as it may enhance overall performance (e.g. Bull et al., 1987; Hannan et al., 2008; Lazear and Rosen, 1981), we argue that this competition incentivizes overinvestment because people want to keep up with the Joneses. In turn, this behavior may cause market failures (e.g. Aronsson and Johansson-Stenman, 2008; Aronsson and Johansson-Stenman, 2014; Aronsson and Johansson-Stenman, 2010). This behavior may seem optimal to the self, but it is suboptimal to society. When we continue to compete with those around us, the consequences are potentially fatal, one notable example being *Karoshi* – death by exhaustion in Japan (Frank, 1985). This is a prime example of why positional preferences have unintended external effects because this behavior and inefficient use of resources signals social status (e.g. Alpizar et al., 2005; Aronsson and Johansson-Stenman, 2008).

Economists define us as positional if our preferences for social standing, consciously or subconsciously influence our consumption decisions. The formal concept of positionality was established by Hirsch (1977) who saw the social structures of society as a limit for everybody to be on top. We are striving to outperform comparable others and as we ascend on the social ladder, the number of top positions decreases. On the individual level, we over-provide work hours because we want to be the first one in the office in the morning or the last one to leave.

When there is a social status associated with certain commodity goods, people may feel tempted to invest in conspicuous consumption to signal a higher social class than they would otherwise do (Rauscher, 1997). Along with the external effects potentially arising from positional preferences, this calls for policy intervention to steer the behavior back to the right path. To achieve the first or second-best solution, theoretical research on positional preferences research has suggested the use of policy instruments through taxation or fees (e.g. Aronsson and Johansson-Stenman, 2008; Aronsson and Johansson-Stenman, 2014; Aronsson and Johansson-Stenman, 2010; Aronsson and Mannberg, 2015).

If we want to use taxation as an instrument to mitigate unintended behavior, we need to understand with whom people compete. We already know that people compete for social status, but we do not know who their competitors are, or how they compare and compete over different commodities. From the literature, we know that people display positional concerns over a wide variety of domains. Income and consumption goods elicit positional concerns, (e.g. Alpizar et al., 2005; Carlsson, Johansson-Stenman, et al., 2007; Celse, 2012; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 1998), whereas preferences for time and vacation may vary between cultures and income levels (Akay et al., 2012; Carlsson, Nam, et al., 2007).

Although these studies provide evidence that our behavior changes between different social groups, we are still to understand how comparison with different groups influences our decisions in domains other than income or time. There is little experimental research on with whom people compare and compete for different commodities. Some studies asked people to state with whom they are most likely to compare their income (Carlsson et al., 2008; Carlsson and Qin, 2010; Clark and Senik, 2010; Frank, 2005; Knight et al., 2009; Luttmer, 2005), and found that those geographically and socially close are most likely to constitute the reference group. Others have found that income comparison is more likely to partake with colleagues than family or friends (Clark and Senik, 2010) and that individuals in rural China use neighbors or people in the same village as their point of reference (Carlsson and Qin, 2010; Knight et al., 2009). Neither of these studies explores how this comparison may influence positional concerns, which is the mandate of our first study. At the time of writing, we know of only one other study exploring how different groups influence positional preferences. However, this study by Akay et al. (2012) focuses only on income and find that comparing with a neighbor has a higher effect on positional concerns than comparing with any of the

other five (friends, colleagues, relatives, people of the same village, people in the same city) reference groups. In sum, previous research suggests that reference groups' comparison may affect positional preferences, although we still do not know if these groups influence preferences in domains other than income. This is the basis for our first study, in which we experimentally varied the reference groups in the hypothetical scenarios. For this study, we also explored how social identification influenced positional preferences in the relevant domain.

From relevant literature on we note that, with few exceptions, researchers use only a single consumption level to tease out positional preferences (Celse, 2012; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 2005). Neither of these studies reports on the differences, although increased values indicate a larger share of positional answers. Another notable absence from the literature is the focus on the subject in decision-making. We observe that some choose to decide for a child (Celse, 2012) or a relative (Alpizar et al., 2005; Carlsson et al., 2008; Johansson-Stenman et al., 2002) instead of the self. They argue that this is better because it may be difficult for respondents to disregard their current circumstances. This makes the ground for our second survey, a methodological analysis of the preferred instruments we use to elicit positional preferences. We vary both the levels and the subject to check if the instruments are robust. Only by this approach can we ensure that the results and findings are valid.

Finally, we have a lot of information about how, when and for what domains individuals are positional, but we have limited information about how these preferences influence their individual wellbeing. From the literature, we know that social comparison with referent others affects how we feel about ourselves (Clark and Oswald, 1996; Luttmer, 2005), and we know that comparing upwards has a stronger effect on individual wellbeing than comparing downward (Senik, 2009). We also know that when the average level of education increases, the effect on individual wellbeing diminishes (del Mar Salinas-Jiménez et al., 2011). If we look at the society as a whole, less inequality yields higher satisfaction (B. Roth et al., 2017). What we do not know is how positional preferences in different domains influence how satisfied we are with life. This is also an attempt to bridge the knowledge from economics with established research from psychology by using the positional preferences framework by Solnick and Hemenway (1998) as an explanatory factor when estimating the SWLS (satisfaction with life score) by Diener et al. (1985).

2. Aims

The primary aim of our study was to test what contributes to positional preferences and what effect these preferences have on individual wellbeing. To contribute to this, we established the following goals:

- Does reference groups or social identity influence if people prefer the positional choice, and does this effect vary for domains?

- Since we rely on a set of established tools, what happens if we experimentally vary the levels and targeted subject? Will this affect positional preferences?

- Are people who prefer the positional option in hypothetical decisions less satisfied with life, compared to those who prefer the egalitarian or absolute option?

The first objective relates to the reference groups in hypothetical decision-making, as well as the social identity of individuals. When we choose one potential state of the world over the other, we are considering our endowments to that of others. The importance of "others" is the main mandate of the first study, we want to know how comparing with someone close and relevant influences positional preferences. In addition, we explore if social identification with a specific domain affects positional preferences in this same domain.

Our second objective relates to the methodology commonly used for the elicitation of positional preferences. We have observed that there is little attention to the values, and only a few studies include more than one reference level. In addition to this, we vary the targeted subject, that is, for whom the participant is deciding. We assume that both a variation in the levels and a variation in the subject will influence positional preferences.

The final goal is to understand the effect of positional preferences in multiple domains on satisfaction with life. Although there exists some research related to this topic, we try to extend the knowledge by bridging the field of economics with psychology. We assume that individuals with positional preference are less satisfied with life, compared to those who are less concerned with social standing, or who have inequality aversion.

3. Positional preferences

In this section, we shed light on our approach in each of our three studies. We elaborate on how we build on existing findings by augmenting and employing well-established methods.

When measuring positional preferences, we use hypothetical decision-making, which is why we finish this section by elaborating on the challenges that may arise from this approach.

3.1 Identification

To define the marginal degree of positionality, we assume that the individual has a utility function of the form: $u_i(x_i, \Delta_i(x_i, \bar{x}))$, where x_i is the individual consumption of the good, and $\bar{x}$ is the average level of consumption of the reference group. We define an individual's utility (u_i) as a function of both her absolute level of consumption (x_i) and her relative level of consumption (Δ_i), which makes it possible for us to define the marginal degree of positionality (γ) as the fraction below:

$$\gamma = \frac{\frac{\partial u_i}{\partial \Delta_i}\frac{\partial \Delta_i}{\partial x_i}}{\frac{\partial u_i}{\partial x_i} + \frac{\partial u_i}{\partial \Delta_i}\frac{\partial \Delta_i}{\partial x_i}} \tag{1}$$

It is common to use either a ratio comparison utility function, $u_i = (x_i, x_i/\bar{x})$ or an additive comparison utility function, $u_i = (x_i, x_i - \bar{x})$. In both expressions, the individual level of consumption is x_i and $\bar{x}$ is the average level of consumption in society (Carlsson, Johansson-Stenman, et al., 2007).

Since we cannot observe the true behavior of the individual, we use a hypothetical decision-making framework established by Solnick and Hemenway (1998). With this approach, researchers tease out positional preferences, by asking participants to choose their desired state of the world. We build on this framework by utilizing a setup common in the studies of positional preferences, exemplified by the following: (e.g. Celse et al., 2017; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005):

- State A: You have 100 000 in yearly wage, others on average have 200 000
- State B: You have 50 000 in yearly wage, others on average have 25 000
- State C: You have 50 000 in yearly wage, others on average have 50 000

In the first alternative (the absolute highest), the individual has less than the average in society, but in the second alternative (the relatively highest), they have more than the average in society but less than in the first option. The first state is optimal if they seek to maximize

their own consumption, but the second is optimal if they care only about their relative standing.

If we assume that the utility function of the individual is additively separable and linear (e.g., $u_i(x_i, \Delta_i) = x_i + \gamma \cdot (x_i - \bar{x})$), this approach makes it possible to calculate the marginal degree of positionality. Using the relation between own and others' consumption which makes the individual indifferent between two options, the marginal degree is illustrated with the following equation (2):

$$\gamma = \frac{Subject_{absolute\ (A)} - Subject_{positional(B)}}{Reference_{absolute(A)} - Reference_{positional(B)}} \tag{2}$$

In the numerator, the "subject$_{absolute\ (A)}$" is the individual endowment in the first alternative, and "subject$_{posiitonal\ (B)}$" is the individual endowment in the section alternative. With the example from earlier studies above, this gives 100 000 in the first option, and 50 000 in the second option, with a difference of 50 000. In the denominator, the "reference$_{absolute\ (A)}$" is the amount endowed to the reference group in the first alternative, and "reference$_{posititonal\ (B)}$" is the endowment of the reference group in the second alternative. With 200 000 in the first scenario, and 25 000 in the second scenario, the difference is 175 000. The fraction in equation (2) then gives us the following:

$$\gamma = \frac{100\ 000 - 50\ 000}{200\ 000 - 25\ 000} = \frac{50\ 000}{175\ 000} = 0.285 \tag{3}$$

With this example, the marginal degree of positionality is 0.285. This is the same formula used by Carlsson et al. (2008) and Alpizar et al. (2005). Starting with this study, the authors measured positional preferences across multiple domains such as income, vacation time, educational achievement, and intelligence. More recent studies have extended and augmented this approach to cover these as well as multiple other domains, finding evidence that income elicits stronger positional preferences than time (e.g. Celse, 2012; Grolleau, Mzoughi, et al., 2012; Hillesheim and Mechtel, 2012; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005).

In the classical setup, the subject chooses between only two different alternatives, labeling them as either positional or not positional. However, there including that individuals may

display inequality aversion, for which neither state is optimal. To encounter this, some authors have augmented the approach by Solnick and Hemenway (1998) by including a third option, the egalitarian alternative as well (e.g. Celse, 2012; Celse et al., 2017; Grolleau, Ibanez, et al., 2012), which we also included in the example. This alternative is optimal if the individual is inequality averse and does not want her endowments to be different from what comparable others haves. If the individual chooses this state, they have the same as if they choose the positional state, but also the same as the reference.

The egalitarian option is optimal if the individual displays inequality aversion, but some individuals may prefer not to answer or not to choose. In the study by Hillesheim and Mechtel (2013) they included an option to refrain from answering if the participants could not choose between the absolute or the positional option. The results do not specify how many choose this "no answer" option, but overall, the share of positional answers tallies to an average of 31% across all domains and questions. This survey also makes an example of how individuals seek status by having more than the reference. One subgroup received the questions without the reference value, whereas the treatment group evaluated their endowment to the reference point. For the control group, evaluating the values without any reference for comparison, the share of positional responses tallies to an average of 10% across all questions, only one-third of the responses for the treatment group (Hillesheim and Mechtel, 2013).

3.2 Domains and findings in existing research

In our studies, we used various domains. In this section, we explain why we chose them and how we decided on the values we used. There are arguably several domains we should study, but due to both funding and length, we limited the selection. Human beings have an innate need for security, form social relations and reproduce. Our abilities to cooperate and form societies give us an evolutionary advantage, and we increase our chances for survival by belonging to different social groups (Baumeister and Leary, 1995; Dunbar, 2003; Dunbar and Shultz, 2007; Kurland and Beckerman, 1985). When we have our fundamental security needs covered, we seek recreation and self-realization through the consumption of various goods (Maslow, 1943). We study a selection of domains related to this, which we define as the most important domains in life. We use the domain *income* in all of our three studies because this gives possibilities for consumption and social economics standards, and we use *physical characteristics* in our first and third because this says something about how we want to look in the eyes of other people. In addition to these two domains, we use *social media popularity,*

and *work performance* in our first study, *SAT-score,* and *size of home* in our second, and *vacation days* in our second and third.

We use *income* in all of our three studies because this is perhaps the most common domain in the studies of positional preferences (e.g. Alpizar et al., 2005; Carlsson et al., 2008; Carlsson, Johansson-Stenman, et al., 2007; Solnick and Hemenway, 1998). In one study, the authors found that almost half of the 238 individuals in the sample preferred the positional alternative when the income was 50 000 (reference 25 000) over the absolute highest with an income value of 100 000 (reference 200 000) (Solnick and Hemenway, 1998). In later research, we observe that various researchers use these specific values when eliciting positional preferences. The share of positional answers shifts from 35% (Bogaerts and Pandelaere, 2013) to 48% (Solnick and Hemenway, 2005), indicating that a relatively large share of people holds positional preferences for income.

Although multiple studies measure positional preferences for income, Senik (2009) finds that underperforming has a great effect on individual welfare when compared to a reference point. We noticed that the annual median wage for men in 2020 in the US was roughly USD 50 000[1]. When we established our values, we ensured that they were both realistic and attainable.

However, second to income, leisure time is another frequently studied domain in research on positional concerns. In two of our three studies, we used *vacation days* as a positionality domain. By using vacation days or weeks, scholars elicit positional preferences using the same framework as for income. Vacation is often perceived to be less positional than income, with around 15% positional choices (Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). However, in the study by Alpizar et al. (2005), they contradict this and find that relative concerns are indeed important for time as well. In a more recent study, this finding was replicated, and these authors found that both vacation weeks and income provides around 45% share of positional answers (Grolleau, Mzoughi, et al., 2012). We observe that about 23% of American workers have no paid vacation, and the USA is the only industrialized country without any federal laws entitling its workers to a minimum of paid leisure time (Maye, 2019; Ray et al., 2013).

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[1] https://www.thebalancecareers.com/average-salary-information-for-us-workers-2060808 on November 1st 2021

In addition to income, we use domains *beauty, physical strength*, and *physical attractiveness*. The focus in our first study is on gender stereotypical domains. Therefore, we assume beauty and desirable traits to be valued characteristics for women, whereas physical strength and ability to accumulate wealth are valued characteristics for men (Baumeister et al., 2017; Bem, 1981; Buss, 1989; Eagly and Wood, 2016; Geary et al., 2004; Kenrick and Keefe, 1992; Udry and Eckland, 1984; Wiederman, 1993). In our third study, we use the gender-neutral domain physical attractiveness. All these three are physical characteristics. We theorize that people who are very concerned with their exterior appearance care about this and if you are positional about appearance, your satisfaction with life decreases. Although we say that beauty comes from inside, there are certain traits we deem as universally attractive. One example is average facial proportions (Pallett et al., 2010). From psychology, we have the James-Lange theory of emotion. This states that we interpret a physical reaction through emotional behavior[2]. There is, however, a theory challenging this, stating that our physiological reactions are instead is a consequence of our emotions (Cannon, 1927). Regardless of the causal effect, we know that happy people smile more (Diener et al., 1995). To find relevant and realistic values, we used a scale running from 1-100, where the top value would signal the most attractive person on the planet. We observe that the numeric scale is used in earlier studies, making it possible to place our studies in existing literature (e.g. Bogaerts and Pandelaere, 2013; Grolleau, Mzoughi, et al., 2012).

These first three domains were the only ones we used in all three studies. In our first one, in addition to income, beauty, and physical strength, we used *work performance* as well. This is a rather abstract concept, and it is difficult to assess what values are attainable and realistic. We wanted to avoid making them too large, as we have observed that some researchers employed values too large to the general population (Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). To find values for work performance, we used the same nominal scale as for beauty and physical strength, with the same values in all alternatives as in these two domains.

The final domain in our first study was s*ocial media followers*, which may act as a proxy for social popularity in real life (Bonds-Raacke and Raacke, 2010; Nadkarni and Hofmann, 2012). In turn, how popular you are in social media may signal your social abilities towards

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[2] https://www.verywellmind.com/what-is-the-james-lange-theory-of-emotion-2795305 on December7th 2021

other people. Similar to domains work performance and physical characteristics, assessing the values for social media followers is difficult. Some suggest that a macro-influencer is someone with at least 1 000 followers[3], which is why this constitutes our base level in the positionality question,

In our second survey, we measured positional preferences for *SAT-score,* as a proxy for intelligence. We observed various takes on measuring positional preferences for intelligence. Some use Arbitur test score, equivalent to A-level, taken at the end of the school term in Germany (Hillesheim and Mechtel, 2012; Hillesheim and Mechtel, 2013), whereas others have used IQ as a measure of intelligence (Grolleau, Mzoughi, et al., 2012). In line with Bogaerts and Pandelaere (2013), we use an SAT-score measure since the sample in our second survey is representative from the US. Due to the construction of the test, a score lower than 300 is almost impossible, and the average score in 2020 was 1051[4]. The share of positional responses for IQ varies from 27 percent (Celse, 2012) to 58 percent (Grolleau, Mzoughi, et al., 2012), and for SAT-score it was 42 percent (Bogaerts and Pandelaere, 2013). These findings suggest that measuring intelligence is difficult, but we still chose to include it in our study to contribute new insight to the literature.

The final domain we use is the size of the home, with two different questions in our second survey. To measure positional preferences for home size, we use both *size of house* and *size of apartment*, since people may have lived in both depending on their current circumstances. If you have a high disposable income, you can spend a larger amount on expensive consumer goods such as cars or houses. This splurging may signal a high socio-economic status as these are both visible consumption goods, which tend to be more positional than less visible goods such as insurance (Alpizar et al., 2005; Clingingsmith and Sheremeta, 2018). In relevant studies measuring the size of a home, they find that number of rooms elicits 30 percent positional answers (Solnick and Hemenway, 2005), square meters and square feet elicits 34 percent positional answers (Bogaerts and Pandelaere, 2013; Hillesheim and Mechtel, 2013). Since we use a representative sample from the US, we employ square feet as our measurement, and we know that anything below 300 square feet is considered unlivable[5].

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[3] https://www.cmswire.com/digital-marketing/social-media-influencers-mega-macro-micro-or-nano/ on December 7th 2021
[4] https://insights.collegeconfidential.com/average-sat-score on December 8th 2021
[5] https://www.apartmenttherapy.com/what-is-considered-a-small-apartment-243701 on December 8th 2020

This marks the lowest value for size of apartment in our study. For the size of house domains, we multiplied the values by three the lowest alternative.

3.3 Reference groups and social identity

Our first study had two distinct focuses. The first was to look at how *reference groups* (with those we compare) influence positional preferences, and the second was to look at how social identity affects these decisions. To elicit positional preferences, researchers have asked people to make decisions comparing themselves to a reference consisting of "society" (Alpizar et al., 2005; Carlsson, Johansson-Stenman, et al., 2007) or an undefined "other" (Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). In our study, we vary the reference groups between participants. When assessing something, we use a proxy, someone similar to ourselves to predict how we will perform at a given task (Lubbers et al., 2009; Suls et al., 2002). This is why we use two close reference groups (friends and colleagues) and one distant group (society) in our experimental design.

We need a threshold for comparison when we assess if our income is high enough or if our effort at work is sufficient (Suls et al., 2002). When we evaluate certain values, we use a proxy, someone similar to ourselves in attributes or competence, and try to assess what this proxy feels about the situation. Comparing ourselves to others is fundamental to our nature as we are incapable of assessing something completely objectively. Taking grades as an example, the instinctive reference group is close friends, whereas distant acquaintances serve as the more deliberate option (Lubbers et al., 2009). If we assess our performance at work or our income, our colleagues tend to resemble us in education and personal attributes. This is why we decide to use *colleagues* as the domain-relevant reference groups for domains *income* and *work performance.*

Outside of work, we socialize with our friends, at parties or different events. When we want to achieve social popularity, those nearby, and in similar life situations tend to be the relevant comparison group. If we compete for the attention of a potential mate, our competition is individuals similar to ourselves and of the same gender. This is why we decided to use *friends* as the relevant reference group for domains *beauty*, *physical strength*, and *social media followers*. In addition to these two reference groups, we included a third – *average in society*, to check if the closeness was significant. For all five domains, we randomized the reference to test if any was significant for the share of positional answers.

Finally, since we are interested in checking how the gender of the participants and the reference groups influence the share of positional answers, we experimentally varied the gender information the individuals read. Either they read *"male friends"*, *"female friends"* or just *"friends"*. Our prediction is that comparing with someone close and relevant increases the share of positional answers because we tend to compare and compete more with those close to us (e.g. Black, 2000; Lubbers et al., 2009), and when the same people outperform us, we feel threatened (Tesser, 1988).

Since we evaluate the importance and relevance of social closeness on positional preferences, we bring about new insight with our analysis. There is only a handful focusing on how social closeness affects our wellbeing, although none has experimentally tested the effect on positional preferences (Clark and Senik, 2010; Frank, 2005; Luttmer, 2005). Second, since we control for the gender of the participant and the reference group, this allows us to experimentally test if either of these affects positionality and if this effect varies with domains. According to Black (2000), there are significant gender differences in conflict resolutions. Between best friends, females score higher on communication and lower on an inclination to withdraw, than between male best friends (Black, 2000).

In addition to the reference groups, we also focused on *social identity.* Whether work, income, gender, or your social popularity is the most important factor for how you define yourself, we use all of these four components to test their relative importance for positional preferences. We rely on the hierarchical model established by (Leach et al., 2008), and use five different components. In *section 6.2.1,* we elaborate on how we employ this tool. To the best of our knowledge, no existing studies have evaluated if people are more inclined to display positional preferences for a domain in which they identity socially. This is the third contribution of our first study.

3.4 Caveats with hypothetical decision making

Measuring positionality is challenging because we use hypothetical decisions to tease out real-life preferences. Faced with hypothetical choices, individuals are likely to overestimate their preferences or willingness to pay for certain goods. In the economics literature, we define this as hypothetical bias. In their study, Murphy et al. (2005) estimated this bias to be 1.35, lower than the anticipated two to three times overestimation. However, in this study,

they focused on willingness to pay with both hypothetical and actual values. For our research, the focus on social interaction is of relevance.

Comparing the behavior in a prisoner's dilemma experiment Vlaev (2012) found that the individual's stated preferences are twice that of their real preferences when facing real stakes. However, this study also finds that we not only overestimate our actions, but also that of the other parties in a social cooperation game. Regardless of the negative outlook from hypothetical choices, we still choose to go through with them to contribute to the literature. If we were to undertake an incentivized experiment, this would arguably be very expensive and would limit the number of participants. In addition, there is still a chance that they may display choices that they think we want to find, and not the choices that reflect their own preferences. Since we use hypothetical choices, and we employ the same methods as existing studies (e.g. Alpizar et al., 2005; Bogaerts and Pandelaere, 2013; Carlsson et al., 2008; Carlsson, Johansson-Stenman, et al., 2007; Carlsson, Nam, et al., 2007; Carlsson and Qin, 2010; Celse, 2012; Celse et al., 2017; Johansson-Stenman et al., 2002; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005), it is easier to compare our findings to already existing.

The alternative to hypothetical decisions is a real-life experiment with real stakes and incentives. This is both more expensive and time-consuming than using theoretical choices. However, in the discussion in *section 7,* we discuss some potential implications and limitations from our approach.

4. Satisfaction with life

Our first two studies are mainly focused on positional preferences and how and when individuals are positional. However, for our final study, we wanted to use this insight and information as an explanation for what contributes to satisfaction with life. Therefore, we use this section to shed some light on what we mean by satisfaction with life and how this has been measured on earlier occasions.

In economics, we want to maximize utility for the individual. We want to achieve as much welfare as possible for society. When we achieve this, we define this state as Pareto optimal – it is not possible to make someone better off without making someone else worse off. In short, we want people to be as satisfied with their life as they possibly can. According to a study

from Oxford University Saïd Business School[6], productivity increases with happiness (Bellet et al., 2019).

Every year, the UN releases its World Happiness Report and for 2021, this focuses on the ramifications of the Covid-19 pandemic. To rank the countries, they use data from Gallup World Poll covering the Cantril Ladder Method[7] for happiness. With this question, they use a ten steps ladder with 10 and 1 as the best and worst possible life situations. Individuals a rate where they stand today, and where they expect to stand in the future. Although this measure perceived social standing, it fails to capture emotional wellbeing. Pooling the results, Gallup defines individuals as thriving, struggling, or suffering based on individual responses. In our third study, we focus on life satisfaction for a representative sample from the USA. Therefore, we should be careful when we generalize these findings as valid for the whole world since people from different countries may vary in what they focus on for wellbeing.

With our third study, we are concerned with the individual perception of wellbeing. Instead of using the Cantril Ladder, we want to employ methods previously used in economics or psychology. In the economics literature, studies are covering how people feel about themselves, and as briefly mentioned in the introduction, these studies assess individual wellbeing with a singular question of the form "*how happy are you with your life?*" (del Mar Salinas-Jiménez et al., 2011; S. Roth et al., 2015; Senik, 2009). Using a single-item approach represents a methodological trend, and we observe that this way of measuring is common in psychology (Fonberg and Smith, 2019). However, although we want to use an approach with multiple questions, findings are suggesting that the results would be similar (Cheung and Lucas, 2014; Fonberg and Smith, 2019).

We employ the framework established by (Diener et al., 1985). In *section 5.3.3* we elaborate on this tool and how we use it.

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[6] https://www.ox.ac.uk/news/2019-10-24-happy-workers-are-13-more-productive on December 7th 2021
[7] https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx on December 7th 2021

5. Research design and methods

5.1 Hypotheses

This first study had six different hypotheses, five related to positional preferences and one related to the effect of social identity. Of these, the first two relate to reference groups and the next three to the effects of gender. The final hypothesis relates to the effects of social identity.

H1.1: People display more positional concerns when the reference group is socially close than when it is distant.

H1.2: People display more positional concerns when the reference group is socially relevant for the activity at hand.

H1.3: Men display more positional concerns in stereotypically male domains.

H1.4: Women display more positional concerns in stereotypically female domains.

H1.5: People display more positional concerns when they compare with others of the same sex, especially in gender-stereotypical domains.

H1.6: People display more positional concerns when the activity is linked to a social identity that is central to the individual's self-concept.

The second study had two hypotheses, with one related to the reference levels and the second related to the targeted subject.

H2.1: The share of positional answers increases when the levels increase.

H2.2: The share of positional answers increases when individuals make decisions for a distant relative rather than for themselves.

Our final study had two hypotheses and a single research question, all three revolving around the effect of positional preferences on life satisfaction.

H3.1: *Individuals who are positional score lower on life satisfaction than those who display absolute or egalitarian preferences.*

H3.2: *The more positional an individual is, the less satisfied with life she is.*[8]

Research question 3.1: *Is there a difference in how different domains affect the satisfaction with life scale?*

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[8] This is a slight modification of the preregistered hypothesis:
There is a greater effect of positional preferences on life satisfaction when the marginal degree increases

5.2 Recruitment and participants

For each of our three studies, we recruited participants using Prolific Academics (prolific.co). Prolific is similar to Mturk, but there are several reasons why we prefer the first to the latter. First, we want to have as many potential participants as possible, and according to Prolific, their pool is almost double that of Mturk. Further, we wanted to use a diverse sample where the share of top responders (answering more than 40% of the studies) is as low as possible. With Prolific, we managed this. We also found it necessary to give our responders an ethical reward, but most importantly, we wanted to manage their responses anonymously, to comply with Norwegian GDPR regulations. (https://prolific.co/).

Upon completion, we rewarded the participants GBP 7.5 an hour as an incentive to participate. This compensation is deemed as "good" by Prolific. To ensure anonymity in line with GDPR, we used the online tool JATOS[9] to distribute the survey.

For our first study, we recruited a sample of 2750 different individuals. 73 percent (N = 2018) provided complete and consistent. Of these, 57.7 identified as male and the average age was 31 years. During data collection, we asked about monthly income, if they were students, and what kind of cities or villages they lived in. About 60 percent of the sample lived in small cities or rural areas, the average monthly income was USD 1001-2000 and 36 percent of the sample identified themselves as students.

For our second survey, we used a representative sample of 1300 US individuals with an equal distribution in age and gender. Of these, 86% (N = 1119) provided complete answers to all questions including the social demographic indicators. Half the sample identified as males and the other half identified as females. We omitted those who did not identify as either. Throughout the survey, it was possible to refrain from answering the positionality questions, although we omitted these observations from the final sample.

For our final study, we decided to use a representative sample as well, and we sent out the survey to a sample of 1300 US individuals. Of these, 859 (66%) provided complete and consistent responses. 51% identified as females, and 49% as males. In addition to this, we

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[9] JATOS (Just Another Tool for Online Studies) is an open source software, which allows researchers to recruit participants via e.g., Prolific Academics or Amazon Turk, without revealing individual answers to these sites (https://www.jatos.org/).

asked about monthly income, how attractive they find themselves, if they have children, hold a university degree or if they are employed. We omitted individuals who did not identify as either gender or who refrained from answering any of the social demographic indicators.

5.3 Survey design

In this section, we start by illustrating how we measure positional preferences, and how our measurement changes between our studies. In the first study, we included multiple alternatives to each positionality question, whereas in the second and third we limited the number of alternatives. Afterward, we present how we measure social identity and life satisfaction, as these are important parts of studies 1 and 3 respectively.

5.3.1 Measuring positional preferences

In our first study, we included five different domains, with one positionality question each. The number of positionality questions in study two was also five although this time we used two questions to measure size of home (house and apartment). Finally, in study three, we had three domains, with three questions each because we increased the marginal degree of positionality between rounds. For each study, the sequence of the positionality domains was random, because we wanted to avoid ordering effects.

In *section 3*.1 we discussed identification and how we tease out positional preferences, using hypothetical decision-making (e.g. Solnick and Hemenway, 1998). Our approach builds on the same example question. We present the subjects with at least three states of the world (depending on the study).

Various researchers have augmented this approach by adding a third option capturing egalitarian preferences (Celse, 2012) or an option to capture indifference (Hillesheim and Mechtel, 2013) because some individuals may suffer from decision or inequality aversion. We chose to include an egalitarian alternative in all three studies as well. If the individual chooses this, they have the same amount as in alternative B (positional) and the same as the reference in society. In a similar piece of research, Celse (2012) argues that this alternative is optimal if the individual expresses inequality aversion.

We tasked the individuals to choose the option that would benefit them, and not what would be the best for society. In addition to the first three options above, we also included an inferior

alternative. This is never optimal as made the individual worse off both in absolute and in relative terms. If they chose this option, it may indicate that they did not understand the study. We limited this alternative to the first study only. Below we present an example question for income with gender-neutral society as the reference:

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 of 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.

If the individuals did not prefer any of the alternatives, they could indicate this by choosing either the "indifference" option or the "no answer" option. However, for the latter, we omitted their observations from the final sample. For our second study, we included the absolute, positional, egalitarian as well as the "no answer"-option, limiting the number of alternatives to four. In our final study, we also included only four alternatives, although we interchanged the egalitarian option with an alternative indicating that all the options were equally good. With this approach, we forced the participants to take an active choice in the positionality questions.

In section (2), we presented the marginal degree of positionality, with an example from existing studies. We used the same formula, substituted the values from alternative A and B into equation (3). In alternative A, the individual has an income of USD 6 300, and in alternative B the individual has an income of USD 5 100. The difference is USD 1 200. This

is the numerator. The reference group has an average income of USD 7 900 in alternative A, and an average income of USD 4 300 in alternative B, The difference is 3 600, and the denominator in expression (4). Since 1 200 is one-third of 3 600, the gamma value becomes 0.33. This is how we calculated the gamma values in each of our studies.

$$\gamma = \frac{6\ 300 - 5\ 100}{7\ 900 - 4\ 300} = \frac{1\ 200}{3\ 600} = 0.33 \tag{4}$$

In both our first and second studies, we kept the gamma value at 0.33 for all domains. However, for our third study, we varied the gamma between each question in each domain. There were three questions, with a gamma value starting at 0.25, the second at .0375, and the highest at 0.50.

5.3.2 Measuring social identity

We aimed to explore how social identity matters for positional preferences. To do this, we augmented the hierarchical approach developed by Leach et al. (2008). This model has five different components sorted into two dimensions – self-definition and self-investment. In the first dimension, the components are *self-stereotyping* and *in-group homogeneity*, and in the second dimension, the three components are *solidarity, satisfaction,* and *centrality.*

Our focus was on the individual's self-concept, i.e., how central the social identity was for an individual's identity. This is why we used only the *centrality* component. This component is measured via four statements for each domain (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*).

In addition to this, we added a fourth question: *How important is […] for how you feel about yourself (your self-esteem)* (scale 1 = not at all important, to 6 = very important). We did this because we wanted to ensure that we could explore the link between social identity and self-esteem. Below is the full set of social identity questions we used in our study:

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***

With an experimental approach, we focus on both the social *closeness* and the social *relevance* of the references group. In this study, we use to test if comparison with friends or colleagues has a greater effect on positional preferences than comparison with an average in

society. In addition to this, we test if social identity with any of the domains has a significant effect on positional preferences. To test this, we augment the approach by Leach et al. (2008) using confirmatory factor analysis to estimate the degree of social identity with gender, work performance, income, and social popularity.

5.3.3 Measuring satisfaction with life

In this study, we take an established tool from psychology and implement the five component measure of life satisfaction, developed by Diener et al. (1985). Using this approach, we ask the participants to rate agreement with five different states on a scale from 1 to 7. Although the scale does not cover aspects such as loneliness, it has high internal consistency (Diener et al., 2013). The five statements are as followed:

> 1) In most ways my life is close to my ideal
> 2) The conditions of my life are excellent
> 3) I am satisfied with my life
> 4) So far I have gotten the important things I want in life
> 5) If I could live my life over, I would change nothing

If the participants rate 7 on all five statements, their total score is the highest possible of 35 and defines the individual as extremely satisfied. On the other hand, if they rate 1 on each statement, their total score is 5, defining the individual as extremely dissatisfied. In our third study, half the sample respond to the life satisfaction statements before the positionality questions and the second half after.

5.4 Econometric analysis

In all of our three studies, we use logistic regression to test our hypotheses. In the first two studies, we use a binary outcome variable, predicting positionality in one of our domains. This variable takes the value 1 if the individual is positional, and zero otherwise. As included regressors, we included a set of demographic variables such as gender, age, employment status, student status, and if they have children. In our second analysis, we controlled for the level treatment and the subject treatment, but we did not control for positionality in other domains. We also controlled for the individuals' reported circumstances by interacting these values with the level treatment in the same domain. In the first study, we controlled for

positional preferences across domains, and we used confirmatory factor analysis to control for social identity in the same domain.

In our third study, we took a slightly different approach by using a factor score for satisfaction with life as the dependent variable. To predict this score, we controlled for positional preferences in one domain with a ladder variable. Since the participants responded to three similar questions with increasing marginal value of positionality, we created a variable controlling for this. This variable had three different outcomes, one for each marginal degree of positionality. If they switched after the lowest gamma value, the variable for this is one, but the remaining are zero. If they choose the positional option for all three gamma values, the variable for the highest gamma was one, but the remaining was zero. We coded it this way to avoid collinearity. If they never preferred the positional option, all variables were zero. In addition to this, we designed a similar variable controlling for egalitarian preferences, with the same structure as the ladder variable for positional preferences.

In addition to logistic regressions, we ran a set of binary tests for all studies. We did this partially to check the hypotheses (study 1), but also to give the reader some insight into the differences in answers across domains and treatment. Since we used a complex model for estimation, we reran all regressions using a simple ordinary least square since we wanted to check if our results were consistent with a simpler model.

6 Results
6.1 Paper 1: With whom, and about what, do we compete for social status? Effects of social closeness and relevance of reference groups for positional concerns

Our first two hypotheses (**H1.1** and **H1.2)** focus on the social closeness and relevance of a reference group. However, contrary to what we initially thought, we see that individuals prefer the positional option when the reference group is distant rather than close, and this difference is significant for all domains and relations except social media between distant and colleagues.

We initially theorized that individuals are more likely to display positional concerns when they compare with a domain-relevant reference group. When we compared the share of

positional answers in both close reference groups, we did not find any significant increase in the share of positional answers. These results reject both our first and second hypotheses.

Our next three hypotheses focused on gender. We theorized that if males and females are more likely to display positional concerns in domains we define as genders stereotypical, such as beauty and social media popularity for females and physical strength, income, and work performance for males (**H1.3** and **H1.4**). We further theorized that when individuals compare with the same gender as themselves, they are inclined to choose the positional option regardless of the domain (**H1.5**).

We found that women display a higher share of positional concerns for beauty compared to physical strength (0.086), and males a higher share for physical strength compared to beauty (0.092). The p-values from Wilcoxon sign rank test confirm that these differences are significant, although it contradicts our hypothesis that beauty is a gender-stereotypical domain. However, comparing beauty for females and physical strength to males, to any of the other domains for both genders confirms that physical strength for males is significantly more positional than any of the other domains. If we look at the domain beauty for females, the share of positional answers is significantly higher than for income, physical strength, and social media popularity, but lower than for work performance.

The results suggest mixed results and only partial support to hypotheses **H1.3** and **H1.4**. Although we can conclude that males are significantly more positional in the domain of physical strength and income, this does not hold for females and domains beauty and social media popularity. Contrary to our initial theory, both females and males display positional concerns for beauty and work performance, and the descriptive results that both males and females are equally positional.

To test our fifth hypothesis, we ran a set of proportion tests for both the female and male subsample. Our theory was that individuals are more likely to display positional concerns when they compare with the same gender rather than the opposite, regardless of the reference group.

Our findings suggest that this holds for men for all domains except physical strength, although this difference is insignificant (p=0.376). For our female subsample, there is only a significant

increase in positional answers for domain physical strength (p=0.010) when comparing a female reference group to a male reference group. These results suggest that there are no significant differences for domains income social media popularity and work performance for women compared with female reference groups. However, for men comparing themselves to a male reference group, there is a significant effect for all domains except physical strength, which is unsurprising as physical strength is a positional domain for both genders. Finally, we can conclude that there is an effect from comparing with a reference group constituted by the same gender as the self, confirming **H1.5**.

Our final hypothesis in this study is slightly different and focuses on the connection between social identity and positional preferences. We theorize that individuals are likely to be positional in a domain central to their social identity. To measure this, we use the results from our social identity statements and calculate factor scores for confirmatory factor analysis. This is the same approach as used by Leach et al. (2008). All the instruments have a KMO (Keiser-Meyer-Olkin test value) and Cronbach's alpha more than 0.7

We test the importance of social identity on positional preferences by running a set of logistic regression, each with one positionality domain as the outcome variable. This table tells us that only those who identify with their income are likely to be positional for income, and those who identify with their social popularity are likely to display positional preferences about social media popularity. Finally, social identification with gender predicts positionality for physical strength, but not for any of the other domains.

Since this study uses only a singular level to elicit positional preferences for each domain, and the targeted subject is always the self, we use these limitations as the basis for our next study

6.2 Paper 2: Levels and subject – Are reference levels and targeted subject important for positional preferences?

Our first hypothesis (**H2.1**) focuses on level variation and we predict that the share of positional answers increases when the levels increase. To test this, we randomized the level treatments and the sequence of the positionality questions. Half the sample answered for themselves and half answered for a hypothetical grandchild. Our second hypothesis (**H2.2**) presumes that positional responses increase when deciding for the grandchild. To test if these

effects are significant we run five logistic regressions, one for each domain. As explanatory factors, we include the level and the subject treatment, and personal characteristics. In addition, we included a variable controlling for the reported value of the individual to the treatment.

We found that neither the medium nor the high-level treatment significant in any domains. This contradicts our initial theory, but it still has important implications for future studies. Our second treatment, deciding for a grandchild, reveals that this is positive and significant in domains size of house and income. We want what is best for our relatives, and may be willing to forego income as long as they are better off than comparable peers are. This is in line with our hypotheses.

If we are to trust the results from our studies, we need to ensure that our instruments are valid. From the research on positional preferences, we observe that most scholars use a singular level of consumption and reference when eliciting preferences. To the best of our knowledge, there are only a few studies including different levels of consumption in the same study (Celse, 2012; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 2005), although none of these studies report on the effect.

This paper had two distinct mandates, the first one was to experimentally test if the level of consumption of both the self and the reference changes positional preferences, and the second is deciding for the self, versus a grandchild elicits different outcomes. From this study, we provide evidence that the measurement instruments are relatively robust across levels and subject variation. Although these results do not confirm our hypotheses, they are reassuring as they validate both our previous study and previous findings in the literature.
The domains income and size of house provide an exception to this, as deciding for a grandchild seems to increase the share of positional answers.

6.3 Paper 3: Positional concerns and life satisfaction – Does your satisfaction with life increase when you are relatively better off than those around you are?

Our first hypothesis (**H3.1**) focuses on the direct effect of positional preferences on life satisfaction. Comparing the egalitarian to the positional alternative, there is no significant

difference in life satisfaction score. Between the positional and absolute alternative, there is a significant difference in score for the first and the second gamma in domain attractiveness.

To formally test if positional preferences influence life satisfaction, we run three different regressions, one for each positionality domain. As the dependent variable, we use confirmatory factor analysis for the five-component satisfaction measure. To control for positionality, we created a variable taking values from 0, 1, 2, or 3. If they are not positional, the variable is zero. If they switch from positional to absolute after the lowest gamma value, the variable is 1. It takes the values 2 or 3 if they choose the positional option for the second or third respectively. Each observation enters only once, to avoid multicollinearity. We also created a variable controlling for egalitarian preferences, following the same formula

We found that the effects from positional preferences were significant and negative. This confirms the first hypothesis and our research question. We cannot only confirm our second hypothesis (**H3.2**), which states that the effect on life satisfaction increases when positionality becomes more expensive. For domain attractiveness, the coefficient switches from insignificant to significant when gamma increases from 0.25 to 0.375, but between the higher gamma values, the effect decreases. Regarding the domain vacation, the coefficient is only significant for gamma 0.50, increasing the effect on life satisfaction compared to the lower gamma values. However, this is still not enough to claim that the effect on life satisfaction increases with the degree of positionality.

With the preceding studies and the existing research, we have knowledge and insight about how, and when, individuals display positional preferences. However, since we have limited insight on the secondary effect from these preferences we want to test how positional preferences affect satisfaction with life. Similarly, with the findings on levels and subject variation, only a handful of studies have looked at the connection between positional and satisfaction with life. Even though these studies use a singular question to measure satisfaction, they find a negative relation between positionality and individual wellbeing (del Mar Salinas-Jiménez et al., 2011; Senik, 2009), which is in line with our findings.

In addition to controlling for positional preferences, we include a set of demographic indicators. From these, we find that having children and having higher education has a negative and significant effect on individual wellbeing. Furthermore, individuals who deem

themselves are attractive are more satisfied with their life, and earning more money is also positive for their wellbeing. We find no difference between genders.

Future studies ought to extend our framework to cover multiple domains and multiple gamma values. Since our lowest gamma value is 0.25, it is very well possible that some individuals are defined as non-positional when they are positional, due to our framework.

7. Discussion and implications

Human beings have an innate need to compare with those around us, and in many cases, we want to be the head of a chicken rather than the tail of a phoenix. This thesis was an effort to understand why and with what effect we compare ourselves to those around us. We had three overarching goals. First, we wanted to test if our point of reference matters when making decisions. Second, we want to know if the classical instruments we use to elicit these preferences are reliable and robust to level and subject variations. Finally, we wanted to understand how such preferences influence satisfaction with life.

All three of our studies have important contributions to the literature. With the first study, we focused on the importance of reference groups and social identity for positional preferences. Our findings suggest, in contradictions to what we initially hypothesized that people are more inclined to choose the positional option when comparing with a random average rather than someone close and personal. With a random selection of individuals, we also found that social identification with a domain is correlated with positional preferences in the same domain. The effect of gender also varied, with an effect of either the subject or the reference in some domains.

With our second study, we wanted to focus on the methods for eliciting positional preferences and vary both the levels and the targeted subject in decision-making. If we are to trust the results from both our earlier findings, as well as existing studies, we need to ensure that our methods and instruments are valid. With a representative sample of US individuals, we randomly varied the targeted subject and the reference levels. Regarding the level variations, we found no significant effects, and the effects from a variation in the subject were less than expected. In many ways, this is a positive sign because it ensures that our preferred approach for elicitation is robust.

Finally, with the last study, we use this knowledge and look at the consequences for society, by understanding the connection between positional preferences and satisfaction with life. Although studies are exploring how positional concerns may influence individual wellbeing, we wanted to study how positional preferences for multiple domains would influence individual satisfaction. With this study, we used the same method for positional preferences as in the preceding studies (Solnick and Hemenway, 1998) predicting satisfaction with life from the five component model by (Diener et al., 1985). We found that positional preferences had a negative effect on satisfaction with life, although the effect varied with the domain.

This thesis provides evidence that the topic of positional preferences is yet to be fully explored. We answer some questions, and we raise new ones. Although our research has important implications for future studies, we also lay out some paths for future scholars to follow. Since we preregistered all three of our studies, we facilitate potential replication. One such replication could include all our treatments in one large study to compare them to each other. This is both time-consuming and expensive, but still one example of how our research can contribute to new experimental designs in the future.

We also encourage future scholars to design an experiment with real-life stakes, although we know that this might prove difficult. We, like those before us, use hypothetical decisions, which may reflect the true preferences of the participants. Regardless of future paths, the field of positional preferences is increasing and we are certain that our studies are important stepping stones for future research.

References

[1] Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development, 40*(2), 428-435. doi:https://doi.org/10.1016/j.socec.2018.12.005

[2] Alpizar, F., Carlsson, F., & Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization, 56*(3), 405-421. doi:https://doi.org/10.1016/j.jebo.2002.10.007

[3] Aronsson, T., & Johansson-Stenman, O. (2008). When the Joneses' consumption hurts: Optimal public good provision and nonlinear income taxation. *Journal of public economics, 92*(5-6), 986-997. doi:https://doi.org/10.1016/j.jpubeco.2007.12.007

[4] Aronsson, T., & Johansson-Stenman, O. (2014). Positional preferences in time and space: Optimal income taxation with dynamic social comparisons. *Journal of Economic Behavior & Organization, 101*, 1-23. doi:https://doi.org/10.1016/j.jebo.2014.01.004

[5] Aronsson, T., & Johansson-Stenman, O. (2010). Positional concerns in an OLG model: optimal labor and capital income taxation. *International Economic Review, 51*(4), 1071-1095. doi:https://doi.org/10.1111/j.1468-2354.2010.00611.x

[6] Aronsson, T., & Mannberg, A. (2015). Relative consumption of housing: Marginal saving subsidies and income taxes as a second-best policy? *Journal of Economic Behavior & Organization, 116*, 439-450. doi:https://doi.org/10.1016/j.jebo.2015.05.011

[7] Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin, 117*(3), 497. doi:https://doi.org/10.1037/0033-2909.117.3.497

[8] Baumeister, R. F., Reynolds, T., Winegard, B., & Vohs, K. D. (2017). Competing for love: Applying sexual economics theory to mating contests. *Journal of Economic Psychology, 63*, 230-241. doi:https://doi.org/10.1016/j.joep.2017.07.009

[9] Bellet, C., De Neve, J. E., & Ward, G. (2019). Does employee happiness have an impact on productivity? *Saïd Business School WP, 13*.

[10] Bem, S. L. (1981). Bem sex role inventory. *Journal of personality and social psychology*.

[11] Black, K. A. (2000). Gender differences in adolescents' behavior during conflict resolution tasks with best friends. *Adolescence, 35*(139), 499-512. Retrieved from https://pubmed.ncbi.nlm.nih.gov/11130594/

[12] Bogaerts, T., & Pandelaere, M. (2013). Less is more: Why some domains are more positional than others. *Journal of Economic Psychology, 39*, 225-236. doi:https://doi.org/10.1016/j.joep.2013.08.005

[13] Bonds-Raacke, J., & Raacke, J. (2010). MySpace and Facebook: Identifying dimensions of uses and gratifications for friend networking sites. *Individual differences research, 8*(1). doi:https://doi.org/10.1089/cpb.2007.0056

[14] Bull, C., Schotter, A., & Weigelt, K. (1987). Tournaments and piece rates: An experimental study. *Journal of Political Economy, 95*(1), 1-33. doi:https://doi.org/10.1086/261439

[15] Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*(1), 1-14. doi:https://doi.org/10.1017/S0140525X00023992

[16] Cannon, W. B. (1927). The James-Lange theory of emotions: A critical examination and an alternative theory. *The American journal of psychology, 39*(1/4), 106-124. doi:https://doi.org/10.2307/1415404

[17] Carlsson, F., Gupta, G., & Johansson-Stenman, O. (2008). Keeping up with the Vaishyas? Caste and relative standing in India. *Oxford Economic Papers, 61*(1), 52-73. doi:https://doi.org/10.1093/oep/gpn015

[18] Carlsson, F., Johansson-Stenman, O., & Martinsson, P. (2007). Do you enjoy having more than others? Survey evidence of positional goods. *Economica, 74*(296), 586-598. doi:https://doi.org/10.1111/j.1468-0335.2006.00571.x

[19] Carlsson, F., Nam, P. K., Linde-Rahr, M., & Martinsson, P. (2007). Are Vietnamese farmers concerned with their relative position in society? *The journal of development studies, 43*(7), 1177-1188. doi:https://doi.org/10.1080/00220380701526303

[20] Carlsson, F., & Qin, P. (2010). It is better to be the head of a chicken than the tail of a phoenix: Concern for relative standing in rural China. *The Journal of Socio-Economics, 39*(2), 180-186. doi:https://doi.org/10.1016/j.socec.2010.02.003

[21] Celse, J. (2012). Is the positional bias an artefact? Distinguishing positional concerns from egalitarian concerns. *The Journal of Socio-Economics, 41*(3), 277-283. doi:https://doi.org/10.1016/j.socec.2012.01.002

[22] Celse, J., Galia, F., & Max, S. (2017). Are (negative) emotions to blame for being positional? An experimental investigation of the impact of emotional states on status preferences. *Journal of Behavioral and Experimental Economics, 67*, 122-130.

[23] Cherry, K. (2020). The James-Lange Theory of Emotion. Retrieved from https://www.verywellmind.com/what-is-the-james-lange-theory-of-emotion-2795305

[24] Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life research, 23*(10), 2809-2818. doi:https://doi.org/10.1007/s11136-014-0726-4

[25] Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of public economics, 61*(3), 359-381. doi:https://doi.org/10.1016/0047-2727(95)01564-7

[26] Clark, A. E., & Senik, C. (2010). Who compares to whom? The anatomy of income comparisons in Europe. *The economic journal, 120*(544), 573-594. doi:https://doi.org/10.1111/j.1468-0297.2010.02359.x

[27] Clingingsmith, D., & Sheremeta, R. M. (2018). Status and the demand for visible goods: Experimental evidence on conspicuous consumption. *Experimental economics, 21*(4), 877-904.

[28] del Mar Salinas-Jiménez, M., Artés, J., & Salinas-Jiménez, J. (2011). Education as a positional good: A life satisfaction approach. *Social indicators research, 103*(3), 409-426. doi:https://doi.org/10.1007/s11205-010-9709-1

[29] Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment, 49*(1), 71-75. doi:https://doi.org/10.1207/s15327752jpa4901_13

[30] Diener, E., Inglehart, R., & Tay, L. (2013). Theory and validity of life satisfaction scales. *Social indicators research, 112*(3), 497-527. doi:https://doi.org/10.1007/s11205-012-0076-y

[31] Diener, E., Wolsic, B., & Fujita, F. (1995). Physical attractiveness and subjective well-being. *Journal of personality and social psychology, 69*(1), 120. doi:https://doi.org/10.1037/0022-3514.69.1.120

[32] Doyle, A. (2021, March 23rd). Average Salary Information for U.S. Workers. Retrieved from https://www.thebalancecareers.com/average-salary-information-for-us-workers-2060808

[33] Duesenberry, J. S. (1949). Income, saving, and the theory of consumer behavior. *33*(3). doi:https://doi.org/10.2307/1926590

[34] Dunbar, R. I. (2003). The social brain: mind, language, and society in evolutionary perspective. *Annual review of anthropology, 32*(1), 163-181. doi:https://doi.org/10.1146/annurev.anthro.32.061002.093158

[35] Dunbar, R. I., & Shultz, S. (2007). Evolution in the social brain. *Science, 317*(5843), 1344-1347. doi:https://doi.org/10.1126/science.1145463

[36] Eagly, A. H., & Wood, W. (2016). Social role theory of sex differences. *The Wiley Blackwell encyclopedia of gender and sexuality studies,* ( ), 1-3. doi:https://doi.org/10.1002/9781118663219.wbegss183

[37] Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*(1), 35-47. doi:https://doi.org/10.1016/0167-2681(95)00003-B

[38] Fonberg, J., & Smith, A. P. (2019). The validity of a single question about life satisfaction. *International Journal of Arts, Humanities and Social Sciences, 4*, 38-44.

[39] Frank, R. H. (1985). The demand for unobservable and other nonpositional goods. *The American Economic Review, 75*(1), 101-116.

[40] Frank, R. H. (2005). Are concerns about relative income relevant for public policy? Positional Externalities Cause Large and Preventable Welfare Losses. *The American Economic Review, 95*(2), 137. doi:https://doi.org/10.1257/000282805774670392

[41] Geary, D. C., Vigil, J., & Byrd-Craven, J. (2004). Evolution of human mate choice. *Journal of sex research, 41*(1), 27-42. doi:https://doi.org/10.1080/00224490409552211

[42] Grolleau, G., Ibanez, L., & Mzoughi, N. (2012). Being the best or doing the right thing? An investigation of positional, prosocial and conformist preferences in provision of public goods. *The Journal of Socio-Economics, 41*(5), 705-711.

[43] Grolleau, G., Mzoughi, N., & Saïd, S. (2012). Do you believe that others are more positional than you? Results from an empirical survey on positional concerns in France. *The Journal of Socio-Economics, 41*(1), 48-54. doi:https://doi.org/10.1016/j.socec.2011.10.001

[44] Hannan, R. L., Krishnan, R., & Newman, A. H. (2008). The effects of disseminating relative performance feedback in tournament and individual performance compensation plans. *The Accounting Review, 83*(4), 893-913. doi:https://doi.org/10.2308/accr.2008.83.4.893

[45] Hillesheim, I., & Mechtel, M. (2012). Relative consumption concerns or non-monotonic preferences? *Available at SSRN 2041113*. doi:https://doi.org/10.2139/ssrn.2041113

[46] Hillesheim, I., & Mechtel, M. (2013). How much do others matter? Explaining positional concerns for different goods and personal characteristics. *Journal of Economic Psychology, 34*, 61-77. doi:https://doi.org/10.1016/j.joep.2012.11.006

[47] Hirsch, F. (1977). Social limits to growth, 1976. *Cambridge MA: Harvard University Press), pgs, 87*, 105. doi:https://doi.org/10.4159/harvard.9780674497900

[48] Ismail, K. (2018). Social Media Influencers: Mega, Macro, Micro or Nano. Retrieved from https://www.cmswire.com/digital-marketing/social-media-influencers-mega-macro-micro-or-nano/

[49] JATOS. Retrieved from https://www.jatos.org/

[50] Johansson-Stenman, O., Carlsson, F., & Daruvala, D. (2002). Measuring future grandparents' preferences for equality and relative standing. *The economic journal, 112*(479), 362-383. doi:https://doi.org/10.1111/1468-0297.00040

[51] Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15*(1), 75-91. doi:https://doi.org/10.1017/S0140525X00067595

[52] Kim, T. (2020). Report: Class of 2020's Average SAT Score Drops to 1051. Retrieved from https://www.collegeconfidential.com/articles/average-sat-score/

[53] Knight, J., Lina, S., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China economic review, 20*(4), 635-649. doi:https://doi.org/10.1016/j.chieco.2008.09.003

[54] Kurland, J. A., & Beckerman, S. J. (1985). Optimal foraging and hominid evolution: labor and reciprocity. *American Anthropologist, 87*(1), 73-93. doi:https://doi.org/10.1525/aa.1985.87.1.02a00070

[55] Lazear, E. P., & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy, 89*(5), 841-864. doi:https://doi.org/10.1086/261010

[56] Leach, C. W., Van Zomeren, M., Zebel, S., Vliek, M. L., Pennekamp, S. F., Doosje, B., Ouwerkerk, J. W., & Spears, R. (2008). Group-level self-definition and self-investment: a hierarchical (multicomponent) model of in-group identification. *Journal of personality and social psychology, 95*(1), 144-165. doi:https://doi.org/10.1037/0022-3514.95.1.144

[57] Lubbers, M. J., Kuyper, H., & Van Der Werf, M. P. (2009). Social comparison with friends versus non-friends. *European journal of social psychology, 39*(1), 52-68. doi:https://doi.org/10.1002/ejsp.475

[58] Luttmer, E. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics, 120*(3), 963-1002. doi:https://doi.org/10.1162/003355305774268255

[59] Maslow, A. H. (1943). A theory of human motivation. *Psychological review, 50*(4), 370. doi:https://doi.org/10.1037/h0054346

[60] Maye, A. (2019). No-vacation nation, revised. *Center for Economic and Policy Research*, 1-12.

[61] Murphy, J. J., Allen, P. G., Stevens, T. H., & Weatherhead, D. (2005). A meta-analysis of hypothetical bias in stated preference valuation. *Environmental and Resource Economics, 30*(3), 313-325. doi:https://doi.org/10.1007/s10640-004-3332-z

[62] Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and individual differences, 52*(3), 243-249. doi:https://doi.org/10.1016/j.paid.2011.11.007

[63] Pallett, P. M., Link, S., & Lee, K. (2010). New "golden" ratios for facial beauty. *Vision research, 50*(2), 149-154. doi:https://doi.org/10.1016/j.visres.2009.11.003

[64] Prolific. Retrieved from https://prolific.co/

[65] Rauscher, M. (1997). Conspicuous consumption, economic growth, and taxation. *Journal of Economics, 66*(1), 35-42. doi:https://doi.org/10.1007/BF01231466

[66] Ray, R., Sanes, M., & Schmitt, J. (2013). No-vacation nation revisited. *Center for Economic and Policy Research*, 1-22.

[67] Roth, B., Hahn, E., & Spinath, F. M. (2017). Income inequality, life satisfaction, and economic worries. *Social Psychological and Personality Science, 8*(2), 133-141. doi:https://doi.org/10.1177/1948550616664955

[68] Roth, S., Robbert, T., & Straus, L. (2015). On the sunk-cost effect in economic decision-making: a meta-analytic review. *Business research, 8*(1), 99-138.

[69] Senik, C. (2009). Direct evidence on income comparisons and their welfare effects. *Journal of Economic Behavior & Organization, 72*(1), 408-424.

[70] Solnick, S. J., & Hemenway, D. (1998). Is more always better?: A survey on positional concerns. *Journal of Economic Behavior & Organization, 37*(3), 373-383. doi:https://doi.org/10.1016/S0167-2681(98)00089-4

[71] Solnick, S. J., & Hemenway, D. (2005). Are positional concerns stronger in some domains than in others? *American Economic Review, 95*(2), 147-151. doi:https://doi.org/10.1257/000282805774669925

[72] Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science, 11*(5), 159-163. doi:https://doi.org/10.1111/1467-8721.00191

[73] Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. *Advances in Experimental Social Psychology, 21*, 181-227. doi:https://doi.org/10.1016/S0065-2601(08)60227-0

[74] Udry, J. R., & Eckland, B. K. (1984). Benefits of being attractive: Differential payoffs for men and women. *Psychological Reports, 54*(1), 47-56. doi:https://doi.org/10.2466/pr0.1984.54.1.47

[75] Understanding How Gallup Uses the Cantril Scale. Retrieved from https://news.gallup.com/poll/122453/understanding-gallup-uses-cantril-scale.aspx

[76] Veblen, T. (1899). *The theory of the leisure class*.

[77] Vlaev, I. (2012). How different are real and hypothetical decisions? Overestimation, contrast and assimilation in social interaction. *Journal of Economic Psychology, 33*(5), 963-972.

[78] Wiederman, M. W. (1993). Evolved gender differences in mate preferences: Evidence from personal advertisements. *Ethology and Sociobiology, 14*(5), 331-351. doi:https://doi.org/10.1016/0162-3095(93)90003-Z

[79] Williford, T. (2019). What Is Considered a "Small" Apartment? Retrieved from https://www.apartmenttherapy.com/what-is-considered-a-small-apartment-243701

Paper I

Mageli, I., Mannberg, A. & Heen, E.

With whom, and about what, do we compete for social status? Effects of social closeness and relevance of reference groups for positional concerns.

Manuscript

With whom, and about what, do we compete for social status? Effects of social closeness and relevance of reference groups for positional concerns

Ingvild Mageli, Andrea Mannberg, and Eirik Eriksen Heen

Abstract

We used 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 tested if people are more positional when they compare with friends and colleagues, than when they compare to an anonymous person in society. We further tested 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. 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 find that 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, although we find that both the gender of the participant and of the reference group has an effect on positional concerns in some domains, our analysis also indicate that not all domains are gendered. We discuss potential explanations behind these findings.

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 work be worth dying for? A possible answer to this question is that relative work performance is a strong signal of social status among people who see their profession as a central part of their identity, i.e., that employees who commit karojisatsu are positional about work. In this paper, we analyze the link between social identification and positional preferences, and test if the social closeness and relevance of the reference group matter for positional concerns in different social domains.

It is today widely acknowledged that most people engage in social comparisons and that our wellbeing, at least in part, depends on our social position (e.g. Duesenberry, 1949; Easterlin, 1995; Frank, 1985; Veblen, 1899).

Economists operationalize concerns for social position (positional preferences) as preferences for relative consumption (e.g. Alpizar et al., 2005; Aronsson and Johansson-Stenman, 2008; Aronsson and Johansson-Stenman, 2014; Aronsson and Johansson-Stenman, 2010; Carlsson, Johansson-Stenman, et al., 2007; Clark and Senik, 2010; Clark et al., 2017; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). Positional preferences incentivize agents to over-invest in positional activities to keep up with the Joneses, and therefore cause market failures[1] (e.g. Aronsson and Johansson-Stenman, 2008; Aronsson and Johansson-Stenman, 2014; Aronsson and Johansson-Stenman, 2010). The empirical estimates in Alpizar et al. (2005) suggest that the consumption externalities associated with positional preferences can be large[2]. This motivates policy interventions.

Theoretical research on positional preferences suggest that first- or second-best solutions can be achieved by use of policy instruments in the form of taxes or fees (e.g. Aronsson and Johansson-Stenman, 2008; Aronsson and Johansson-Stenman, 2014; Aronsson and Johansson-Stenman, 2010; Aronsson and Mannberg, 2015). The optimality of these policy instruments hinges crucially on the assumptions made about what, and with whom people compete for social status. Taxes and fees may be optimal if positional goods are limited to a distinct set of status commodities. However, if different social groups are positional about different things, and some groups hold positional concerns for leisure activities and personality characteristics, it can be it difficult, perhaps even impossible, to design a tax instrument that achieves first best (Mannberg and Sjögren, 2021). With whom people compete for social status is important, because the reference group affects towards whom the policy should be targeted and determines if some groups should be exempted from the intervention.

Two important questions are therefore whether the empirical findings support the notion that people mainly have positional preferences for only a limited set of commodities, and whether we know who the Joneses are. The answers to these questions are not unambiguous. There is

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[1] Social comparisons naturally also have positive side effects. For example, under incomplete information, relative performance information can provide both principals and agents with information about the absolute quality of the agents' performance. Social comparisons may therefore enhance overall performance within firms by providing strong incentives to outperform (e.g. Lazear and Rosen, 1981; Bull et al., 1987; Hannan et al., 2008).

[2] Results from tournament experiments further suggest that preferences for social rank can drive agents to avoid competitive settings (Balafoutas et al., 2017), induce advantaged agents to shirk and incentivize disadvantaged agents to cheat or give up (e.g., Bull et al., 1987; Hannan et al, 2008).

relatively ample evidence that visual commodities connected to income or wealth, e.g., cars and houses, trigger positional concerns (Alpizar et al., 2005; Carlsson, Johansson-Stenman, et al., 2007; Solnick and Hemenway, 1998). However, it also appears that other, less wealth-related domains, such as personality characteristics and physical appearance (Hillesheim and Mechtel, 2011; Solnick and Hemenway, 1998), vacations and insurance (e.g. Alpizar et al., 2005) and risky leisure activities (Mannberg et al., 2021) are relatively positional. In other words, the variety of goods that trigger positional concerns is relatively wide. A few studies further suggest that the intensity of positional concerns for income and leisure time vary between different cultures (Carlsson, Nam, et al., 2007), income levels (Akay et al., 2012), and age groups (Akay and Martinsson, 2019). These results indicate that status signaling behavior varies between different social groups. However, we lack knowledge on potential group differences in positional concerns in other domains than income or leisure time. We further do not know anything about the mechanisms behind *why* different groups are positional about different things.

The literature on with whom people compete for social status, i.e., who the Joneses are, is relatively scarce. Senik (2009) uses data from 28 post transition countries (plus Turkey) and find that doing better in life than colleagues and high school mates has a larger impact on satisfaction with life than income comparisons with the general population. Senik (2009) further finds that comparisons with friends and colleagues influence individual welfare more than comparisons with parents. A few studies have asked participants directly about with whom they compare their income (Carlsson et al., 2008; Carlsson and Qin, 2010; Clark and Senik, 2010; Frank, 2005; Knight et al., 2009; Luttmer, 2005). These studies in general confirm the finding of Senik (2009), i.e, that people mainly compare their income with individuals who are socially or geographically close to them. However, not all close reference groups appear to be equally important for income comparisons. Knight et al. (2009) and Carlsson and Qin (2010) find that people in rural China mainly compare with their neighbors and other people in the same village, and that relatively few compare with relatives or with people outside the village. Clark and Senik (2010) use data from the European Social Survey and find that substantially more respondents compare their income with colleagues, than with family, friends or "other". Neither of these studies experimentally test if the reference group affect the degree of positionality. We only know of one study that do so.

Akay et al. (2012) test if income comparisons with six different reference groups (friends, colleagues, neighbors, relatives, people of the same age, and others in the same city) affect positional choices for income among 260 inhabitants in Addis Ababa. Their bivariate analysis suggests that comparisons with neighbors trigger more positional concerns than comparisons with relatives or other people in Addis Ababa. However, probably due to a very low degree of positionality in their sample, these findings do not survive multivariate tests. Taken together, previous research suggests that the reference group *may* be important for positional preferences for income, but we still have no knowledge on how the reference group affects positional concerns in other domains.

The aim of the current study was to add knowledge both on the role of the reference group for positional concerns, and on the question of why people appear to compare more in some domains than other. More specifically, we asked two research questions: Do people display more positional concerns when they compare with a *socially close* and *relevant* reference group than with a distant and abstract group? And, is there a link between our identification with certain social groups (i.e., our social identities) and the type of activities and characteristics that we are positional about?

These research questions are based on previous work in evolutionary and social psychology. Social groups can distribute resources and work tasks among its members and across time. An individual's chances to survive and reproduce are therefore greatly enhanced if she belongs to a group (Baumeister and Leary, 1995; Dunbar, 2003; Dunbar and Shultz, 2007; Kurland and Beckerman, 1985; Suls et al., 2002), and if she holds a relatively high social rank within the group (Anderson et al., 2001; Barkow et al., 1975; Barkow et al., 1992; Baumeister and Leary, 1995). The evolutionary role of social status has created a link between our relative social performance and our self-esteem (Baumeister et al., 1989). Research suggests that we use individuals close to us as a proxy for information on our social performance (Lubbers et al., 2009; Suls et al., 2002). We therefore compare relatively more with specific and close reference groups (e.g., friends) than with general and distant others (e.g. Black, 2000; Lubbers et al., 2009), and we mainly feel threatened when someone who is socially close and similar to us outperforms us (Tesser, 1988). The types of characteristics and behaviors providing agents with social status in a social group depend on the social norms present in this group. Since different social groups have different social norms, the behaviors that signal a high social status can vary between different social settings.

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Most individuals belong to a many different social groups. Our memberships in these groups define our *social identities*, e.g., being a w*oman*, an *economics professor*, and a *long-distance runner* (e.g. Akerlof and Kranton, 2000; Leach et al., 2008; Stets and Burke, 2000; Tajfel, 2010). The relative importance of each these social identities varies from individual to individual, and our self-esteem is especially sensitive to feedback on behaviors that are linked to a social identity central to our self-image (Leach et al., 2008).

Based on the above, we hypothesized that positional preferences stem from the evolutionary advantage that a high social rank provides. We predicted that people would have more positional concerns when they compared with a reference group that was socially close, and relevant for the behavior in question, and when the activity was associated with a valued social identity in that specific domain. We further hypothesized that gender constitutes an important social identity for both men and women, and therefore that men and women compete more with members of the same sex than with members of the opposite sex, especially in gender stereotypical domains. We tested our hypotheses using a survey experimental approach. We elicited positional preferences in five different domains with randomly assigned reference groups. We further randomized information on the gender of members in each of the reference groups.

Our study contributes to the literature in at least three ways. First, we add knowledge on with whom people compete for social status. In contrast to Knight et al. (2009), Carlsson and Qin (2010) and Clark and Senik (2010), who ask with whom people compare their income, we experimentally test if the reference group affects positional concerns. Our study complements the work of Akay et al. (2012) by assessing if the effect of the reference group varies over different domains, i.e., if the relevance of the reference group matters, and by using a larger and more heterogeneous sample. Second, we experimentally test for gender effects on positional preferences. Many 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. Finally, our study represents a first attempt to evaluate the link between positional concerns and social identification. As such, it contributes to an increased understanding of how and why positional preferences differ between different social groups.

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The rest of the article is structured as followed: In section (2), we present our hypotheses, participants, measurement instruments, and experimental design. Section (3) presents the results, and in section (4) we provide a general discussion of our findings. We discuss limitations and implications for future research in section (5).

2. Materials and Method

2.1 Hypotheses

We evaluated the role of social closeness and relevance of the reference group with five hypotheses, and the link between positional preferences and social identity with one hypothesis. All hypotheses were pre-registered on the OSF platform (https://osf.io/mbs9h).[3]

2.1.1 The role of the reference group

H1. People display more positional concerns when the reference group is socially close, than when it is distant.

H2. People display more positional concerns when the reference group is socially relevant for the activity at hand.

2.1.2 Gender

H3. Men display more positional concerns in stereotypically male domains.

H4. Women display more positional concerns in stereotypically female domains.

H5. People display more positional concerns when they compare with others of the same sex, especially in gender stereotypical domains.

2.1.3 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.

2.2 Measurement instruments

2.2.1 Positional preferences and identification

Positional individuals care about how their level of consumption compares to that of others. The utility of a positional agent therefore contains both the absolute and relative consumption value of the positional good. One simple example of a utility function for a positional

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[3] The pre-registered hypotheses had a slightly different phrasing. We have changed the wording to improve readability and interpretation. The predictions remain unaltered.

individual is: $u_i(x_i, \Delta_i(x_i, \bar{x}))$, where x_i is the consumption value of the positional good, and $\bar{x}$ is the average level of consumption value in some reference group. The expression $\Delta_i(x_i, \bar{x})$ represents relative consumption. The marginal degree of positionality measures the fraction of the overall utility increase from a marginal increase in consumption, which is due to increased relative consumption. Labelling the degree of positionality as γ, we can define it as follows:

$$\gamma = \frac{\dfrac{\partial u_i}{\partial \Delta_i} \cdot \dfrac{\partial \Delta_i}{\partial x_i}}{\dfrac{\partial u_i}{\partial x_i} + \dfrac{\partial u_i}{\partial \Delta_i} \cdot \dfrac{\partial \Delta_i}{\partial x_i}} \tag{1}$$

Most previous studies use either a ratio comparison utility function ($\Delta_i(x_i, \bar{x}) = x_i/\bar{x}$) or an additive comparison utility function ($\Delta_i(x_i, \bar{x}) = x_i - \bar{x}$). In this study, we followed (Carlsson, Johansson-Stenman, et al., 2007) and used the simple additively linear utility function $u_i(x_i, \Delta_i(x_i, \bar{x})) = (1 - \gamma) \cdot x_i + \gamma \cdot (x_i - \bar{x})$. Similarly to most other studies on positional preferences, we operationalized γ by use of a set of hypothetical choice scenarios (e.g. Alpizar et al., 2005; Carlsson, Johansson-Stenman, et al., 2007; Celse, 2012; Hillesheim and Mechtel, 2011; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). More specifically, for each domain, we asked our respondents to imagine a situation where they could choose which state of the world to live in. The participants were instructed to choose the alternative that would make them most happy, and not to evaluate the options with regard to what is best for society as a whole. Participants could choose between four alternatives (A - D). An example question for income 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.

Alternative A (absolute) always represented a state of the world in which the individual had most in absolute terms, but relatively less than an average person in the reference group. In alternative B, the individual always had a lower level of consumption than in alternative A, but relatively more than an average person in the reference group. This was thus the positional alternative. Celse (2012) found that a relatively large share of respondents displayed inequality aversion. To avoid that participants with inequality aversion chose the positional alternative, we included an alternative where the individual had the same level of consumption as in alternative B, and the same level of consumption as the average person in the reference group. We controlled for violations of the non-satiation assumption (more is better) by a fourth alternative (D), in which the respondent was worse off both in absolute and relative terms. Finally, we allowed participants to answer that they are indifferent between alternatives, or that they were unable to answer.

In theory, the marginal degree of positionality can be identified by varying the values in alternatives A and B, and finding the relative values that make an individual indifferent between the two alternatives (Alpizar et al., 2005; Carlsson et al., 2008; Carlsson, Johansson-Stenman, et al., 2007). Using the additively linear utility function outlined above, the value of gamma for someone who is indifferent between A and B is given by equation (2).

$$\gamma = \frac{x_A - x_B}{\bar{x}_A - \bar{x}_B} \qquad (2)$$

In this expression, x_A is the individual's consumption level in state A (absolute), and x_B is the consumption level in state B (positional). $\bar{x}_A$ and $\bar{x}_B$ represent the average level of consumption in the reference groups in state A and B, respectively.

In practice, however, it is not possible to estimate γ precisely. Instead, many studies use a lower bound for γ to determine the share of respondents who have a marginal degree of positionality corresponding to at least this level (Celse, 2012; Hillesheim and Mechtel, 2011; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). A few studies have also estimated the distribution of positional preferences in intervals of γ (Alpizar et al., 2005; Carlsson, Johansson-Stenman, et al., 2007). Since the main purpose of our paper was to test if the type of reference group affects share of proportional answers in different domains, and since long surveys may result in mindless responses, we used a lower bound instead of several interval estimates. In other words, participants only read one hypothetical scenario for each domain, and we defined an individual as positional if she or he chose alternative B, and non-positional any of the other alternatives were chosen.

There is no gold standard for which lower bound of γ to use. While some researchers have used values as low as 0.15 (Celse, 2012), others have used values as high as 0.4 (Hillesheim and Mechtel, 2013). In this study, we used a lower bound of γ equal to 0.33. This value can be derived from the above example by the simple calculation in equation (3).

$$\gamma = \frac{6\,300 - 5\,100}{7\,900 - 4\,300} = 0.33 \tag{3}$$

This means that individuals who are identified as positional in our sample had relatively strong preferences for social position: at least 33 percent of the overall utility increase from a marginal increase in consumption is due to increased relative consumption.

2.2.2 Domains and values
We elicited positional preferences in five different domains - income, work performance, physical strength, beauty, and social media followers. These domains represent characteristics that can be expected to signal status in some social groups. Income and work performance are signals of an individual's ability to amass material resources. Physical strength and beauty are signals of physical health and related to reproduction abilities. Previous research suggest that

wealth and protective capacity constitute valuable characteristics for men, while beauty and friendliness are valued characteristics for women (Baumeister et al., 2017; Bem, 1981; Buss, 1989; Eagly and Wood, 2016; Geary et al., 2004; Kenrick and Keefe, 1992; Udry and Eckland, 1984; Wiederman, 1993). We therefore expected physical strength and beauty to be closely linked to men and women's gender identities. Finally, social media followers is a proxy for social popularity (Bonds-Raacke and Raacke, 2010; Nadkarni and Hofmann, 2012), which in turn is an indication of an individual's social abilities.

There is no any standard practice for how to choose the consumption values in the individual questions. Some researchers have used relatively high values that are likely unattainable by a large share of the population (Solnick and Hemenway, 1998; Solnick and Hemenway, 2005), while others have used values that can be lower than the respondent's actual level of consumption (e.g. Hillesheim and Mechtel, 2013). We have not come across any paper that motivates their choice of values. In our study, we tried to use values that represent desirable, but not unattainable values to the respondents.

We used monthly income before taxes to measure positional preferences for *income*, and defined the base level as 10 percent above the median monthly income for men aged mid 40s in the United States in 2019 (see *Table 1*). We added the 10 percent to avoid loss aversion effects. As noted above, we used the number of social media followers as a proxy for social popularity. Social media platforms, such as e.g. Instagram, do not share data on user statistics, and we therefore lacked data on the average number of followers. However, social media communities have defined the minimum number of followers required to be considered as an influencer. A micro-influencer is defined as a person who has at least 1,000 followers[4]. We used this as the base level in the choice scenario for social media followers.

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 similar characteristics (Celse, 2012; Solnick and Hemenway, 1998); Hillesheim and Mechtel (2013) have employed nominal scales and counts to measure the absolute value of the characteristic. We used a

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[4] https://www.cmswire.com/digital-marketing/social-media-influencers-mega-macro-micro-or-nano/ on November 1st 2021

similar approach. More specifically, we use a nominal scale running from 1 to 100 for work performance, physical strength and beauty, with identical base levels across domains.

We present the values used in our choice experiments in *Table 1*. The two last columns show how the individual's level of consumption compared across alternatives A and B, and to the average level of consumption. In each domain, we calibrated the values such that the agent's consumption level in alternative A represented 80 percent of the average consumption value of referent others (see *Table 1*, *column 4*). Further, the individual's consumption level in alternative B (positional) always corresponded to 80 percent of his or her level in alternative A (absolute) (see *Table 1*, *column 5*).

Table 1. Absolute and relative consumption values across alternatives and domains.

Domain	Option	(1) Self (x_i)	(2) Others ($\bar{x}$)	(3) γ	(4) $x_{iA}/\bar{x}_A$	(5) x_{iB}/x_{iA}
Income				0.33	0.80	0.81
	A	6300	7900			
	B	5100	4300			
	C	5100	5100			
	D	5100	7900			
Work performance				0.33	0.80	0.81
	A	52	65			
	B	42	35			
	C	42	42			
	D	42	65			
Physical Strength				0.33	0.80	0.81
	A	52	65			
	B	42	35			
	C	42	42			
	D	42	65			
Beauty				0.33	0.80	0.81
	A	52	65			
	B	42	35			
	C	42	42			
	D	42	65			
Social media				0.33	0.80	0.81
	A	800	1000			
	B	650	550			

C	650	650
D	650	1000

2.2.3 Reference groups and gender

We use three reference groups – society, colleagues, and friends. These groups represent different levels of social closeness and domain relevance. Society is a socially distant reference group, while colleagues and friends are socially close reference groups. Our colleagues resemble us in education and professional preferences, and we likely have more information about their work performance and income than we have about other people in society, including our friends. Our colleagues' performance and income thus provide us with a relatively good signal about our own work-related abilities. We therefore used 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. We therefore used friends as the domain relevant reference group for social media followers, physical strength, and beauty. Finally, to evaluate how the gender composition in the reference group affects positional concerns, we defined each reference group either as male, female or gender neutral, e.g., "male friends", "female friends", or just "friends".

2.2.4 Social identity

We used four social identities - income, work performance, gender, and social popularity. To evaluate the relative importance of our these identities, we relied on the hierarchical model developed by 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.* Since, we were interested in how important the group was for an individual's self-concept, i.e., how central the social identity was for individual's personal identity*,* we only used the *centrality* component. This component is measured via four statements for each domain (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 captured the link between the social identity and self-esteem, we also used a fourth question: *How important is […] for how you feel about yourself (your self-esteem)* (scale 1 = not at all important, to 6 = very

important). The full set of social identity questions are available in section A.1.2 in the appendix.

2.3 Experimental design and sample

Our survey experiment had 9 treatments, 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. In other words, the reference group could be defined as "society" (T7) in the choice scenario on income, and as "female friends" (T6) in the choice scenario on work performance, for the same participant. Each participant answered only one positionality question for each domain, i.e., five choice scenarios in total.

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, respectively) 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 (N=2750) via Prolific Academics (prolific.co). The participants were paid an hourly wage of GBP 7.5 to answer the survey. To ensure anonymity, we used the online tool JATOS[5] to distribute the survey. Of the 2750 individuals who opened the

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[5] JATOS (Just Another Tool for Online Studies) is an open source software, which allows researchers to recruit participants via e.g., Prolific Academics or Amazon Turk, without revealing individual answers to these sites (https://www.jatos.org/).

survey, 2334 (85 percent) agreed to participate and provided valid information on country of residence. The vast majority of these participants resided in Europe (84 percent). Nearly 10 percent of the participants resided in North America, and about 5 percent in South America. Less than 2 percent resided 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. The median participant had a monthly gross income in the interval 1001 – 2000 USD. The median income in the non-student sample (N = 1301) was in the interval 2001-300 US. These numbers are substantially below the median income for men in their 40s in the United States. Our sample should therefore not be regarded as representative for the American population.

3. Results

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

3.1 Positional preferences and social domains

Table 3 displays the responses for each domain, regardless of reference group treatment. About one quarter to one third of participants chose alternative A (Absolute: 23- 27 percent) and B (Positional: 24 – 32 percent) in the choice experiments on income, work performance, physical strength and beauty. In accordance with the findings of Celse (2012), a relatively large share (28 - 39 percent) of our participants 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 was distinctly different from the other

domains. 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	0.274	0.245	0.388	0.068	0.025
Work performance	0.233	0.325	0.348	0.078	0.015
Physical strength	0.232	0.279	0.287	0.158	0.045
Beauty	0.247	0.263	0.305	0.151	0.034
Social media followers	0.130	0.159	0.159	0.474	0.078

To evaluate if our participants were more positional in some domains than in others, we utilized the panel structure of our dataset and estimated a logistic regression with random effects. The outcome variable in this regression took the value one if the individual chose the positional alternative (B) and zero otherwise. We included controls for gender, age[6] and income level. *Table 4* presents the results. As can be seen in the table, our results suggest that participants in our sample were more positional about work performance and physical strength, and less positional about social media followers, than they were for income. We found no statistical difference between the probability that a participant was positional for income and beauty. We further found that women were less positional than men. Finally, our model suggests a U-shaped relationship between age and positional concerns. Our analysis of marginal effects suggests that the degree of positionality is lowest when people are in their fifties.

Table 4. Differences in positionality between domains. Coefficients from a random effects logistic regression. Standard errors in parentheses.

	Positional preferences
Domain (ref is income)	
Work performance	0.486***
	(0.078)
Physical strength	0.213**
	(0.079)

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[6] We divided age by 100 to make the potentially non-linear relationship clearer.

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Beauty	0.115	
	(0.080)	
Social media	-0.643***	
	(0.087)	
Socio-demographics		
Female	-0.263***	
	(0.074)	
Age/100	-6.708***	
	(1.882)	
Age/100 squared	6.404**	
	(2.426)	
Income (log)	0.147***	
	(0.040)	
Constant	-0.995**	
	(0.381)	
Number of observations	10090	
Chi square	232.836	

*** p<0.001, **p<0.01, *p<0.05

3.2 Effects of social closeness and relevance

To evaluate if the social closeness of the reference group affected positional concerns, we tested if the proportion of positional choices was higher when the reference group was defined as friends or colleagues as compared to society.[7] The results are presented in *Table 5*. *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.

Table 5. Effects of social closeness of the reference group on positional choices. Two-sided proportion tests.

	Share of positional choices			Differences		
	Distant	Close				
Domain	Society	Friends	Colleagues			
	(S)	(F)	(C)	S-F	S-C	F-C
Income	0.376	0.161	0.199	0.215***	0.177***	-0.038

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[7] The results in *Table 5* are pooled across the different gender information treatments. In other words, the reference group "Friends" includes "Female friends", "Male friends" and the gender neutral "Friends". The same holds for the reference group categories "Society" and "Colleagues".

Total N	N=668	N=666	N=684			
Work performance	0.385	0.292	0.302	0.093***	0.083**	-0.001
Total N	N=641	N=675	N=702			
Beauty	0.328	0.196	0.264	0.132***	0.064**	-0.068**
Total N	N=650	N=663	N=698			
Physical strength	0.345	0.243	0.251	0.102***	0.094***	-0.008
Total N	N=646	N=723	N=649			
Social media followers	0.182	0.140	0.154	0.042**	0.028	-0.014
Total N	N=708	N=635	N=669			

*** $p<0.001$, **$p<0.01$, *$p<0.05$

The results in *Table 5* clearly reject the hypothesis **H1**. A larger share of individuals displayed positional concerns when the reference group was defined as society than when the reference group was defined as friends or colleagues. With the exception of social media followers, the differences were relatively large and significant. These findings go against the finding of e.g., Clark and Senik (2010) who found that people compare their income with mostly with colleagues, and Lubbers et al. (2009) who found that pupils intuitively choose friends as a reference point. However, neither of these studies analyzed positional *behavior*, i.e., if social comparisons incentivize people to over-consume the positional good. It is plausible that many individuals both compare relatively intensively with, and care relatively much about, people who are close to them. Choice scenarios with close reference groups may therefore trigger both positional and altruistic preferences. This, in turn creates a quandary for positional individuals: they experience a reduction in wellbeing if they have less than others, but also if they improve their own situation at the cost of their close ones'. Our data on egalitarian choices showed that a larger proportion of participants chose the egalitarian option when they compared with friends and colleagues (see *Table A1* in the appendix). However, the difference was only significant in the income and work performance domains. Our explanation is therefore only partly supported by our data.

To evaluate if people expressed more positional concerns when the reference group was relevant for the domain (**H2**), we compared the share of positional answers when the

reference group was constituted by friends to the share when the reference group was defined as colleagues. We hypothesized that colleagues would be a more relevant group than friends for income and work performance, and that friends would be more relevant than colleagues for social media popularity, beauty and physical strength. However, as can be seen in *column 6* in *Table 5*, we only found significant differences in the beauty and income domains. In addition, our results suggest that participants were more positional when they compared both their level of income *and* their beauty with colleagues than with friends. In conclusion, we did 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 were that men and women would be more likely to express positional concerns in traditionally male and female domains, respectively (**H3** and **H4**). We further hypothesized that comparisons with people of the same gender would trigger more positional choices, than comparisons with members of the opposite sex (**H5**).

We present our results for hypotheses **H3** and **H4** in *Table 6* and *Table 7*, below. [8]*Table 6* shows the proportions of men and women, respectively, who chose the positional alternative in the five different domains. We separate between traditionally male (physical strength, income and work performance) and female (beauty and social popularity) domains. The last column of the table shows differences between the shares of positional answers. We evaluated if the differences were significant by use of proportion tests. *Table 7* displays the results of a set of random effects logistic regressions on the male, female and full sample, respectively. In these regressions, we made use of the panel structure of our data and tested for the effect of gender stereotypes. We operationalized the latter by including a dummy variable, which took the value one if the domain was stereotypically male and zero otherwise.

Table 6. Differences in proportions of positional answers across gender groups and domains. Proportion tests

	Proportions of positional choices		Difference

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[8] The results in *Tables 6* and *7* are pooled across gender information treatments. These tables show if men (women) are more positional in stereotypically male (female) domains than in non-gender stereotypical domains, and if men are more or less positional than women in the different domains. We test if the gender of the reference group (e.g., Female friends) affect positional choices in *Tables 8* and *9*.

	Males (M)	Females (F)	M-F
Male domains			
Physical strength	0.360	0.169	0.191**
Income	0.268	0.213	0.055***
Work performance	0.321	0.330	-0.009
Female domains			
Beauty	0.268	0.255	0.013
Social media followers	0.162	0.155	0.007

*** p<0.001, **p<0.01, *p<0.05

As can be seen in *Table 6*, our results suggest that the proportion of positional men was larger than the corresponding proportion of women in the domains physical strength (p<0.001) and income (p=0.005). Our within-group analysis (i.e., comparing women to women, and men to men. See *Table A4* in the appendix) further shows that women in our sample expressed significantly more positional concerns for beauty (25.5 percent) than they did for physical strength (16.9 percent, p<0.001) and income (21.3 percent, p=0.021). By contrast, men were significantly less positional about beauty (26.8 percent) than they were about physical strength (36.0 percent, p<0.001) and work performance (32.1 percent, p=0.001). These results lend some support to hypotheses **H3** and **H4**.

However, we also found evidence that went against our hypotheses. First, we found no differences between men and women in the domains work performance (p=0.673), beauty (p=0.520) and social media followers (p=0.636). Second, our within-group analysis showed that the proportion of women who were positional about work performance (33.0 percent) was larger than the proportion of women positional about beauty (25.5 percent, p<0.001. See *Table A4* in the appendix). Finally, the proportion of men who were positional about beauty was equal to the proportion positional about income (26.8 percent). It is perhaps especially noteworthy that our results indicated that men were equally likely to be positional about beauty as women, and that women expressed positional concerns for work performance to the same extent as men did. The results of our panel data analysis, presented in *Table 7* below.

Table 7. Effects of gender stereotypes on positional concerns. Coefficients from random effects logistic regressions. Standard errors in parentheses.

	Positional preferences

	Males	Females	All
Male stereotypical domain	0.637***	0.222**	0.224**
	(0.069)	(0.082)	(0.083)
Male			-0.002
			(0.100)
Male stereotypical domain# Male			0.407***
			(0.107)
Age	-0.064*	-0.075**	-0.066***
	(0.025)	(0.028)	(0.019)
Age squared	0.001*	0.001	0.001**
	(0.000)	(0.000)	(0.000)
Income (log)	0.105*	0.203**	0.144***
	(0.051)	(0.061)	(0.039)
Constant	-1.142*	-1.505*	-1.325***
	(0.488)	(0.583)	(0.377)
Number of observations	5820	4270	10090
Chi Square	97.544	31.307	146.806

*** p<0.001, **p<0.01, *p<0.05

Table 7 shows that men were significantly more likely to be positional in male stereotypical domains (column 3) than women were. However, our analysis also shows that both men and women were more likely to be positional in traditionally male than female domains (columns 1 and 2). Furthermore, the insignificant coefficient on the male dummy in column 3 suggest that men and women were equally likely to be positional in female domains. These findings go against hypotheses **H3** and **H4**, and suggest that positional preferences among men and women do not confirm to gender stereotypes. It thus seems that not all preferences are gendered.

Hypothesis **H5** predicted that participants would be more likely to choose the positional alternative when they compared with people of their own gender. *Table 8* (male sample) and *Table 9* (female sample) present results from our tests of this hypothesis (proportion tests). Since we randomized the gender information treatment both between and within the

participants, the number of observations differed between domains.[9] We display the distribution of answers across treatments in *Figures 1* and *2,* below. The two figures show the share of positional men (*Figure 3*) and women (*Figure 4*), respectively. In summary, our data provided mixed support for hypothesis **H5**.

Table 8. Male sample - Gender information treatment. Share of positional answers across domains. Two-sample proportion tests

Domain	Gender of referent others			Differences		
	Same gender (S)	Opposite gender (O)	No info (N)	(S)-(O)	(S)-(N)	(O)-(N)
Income	0.318	0.155	0.301	0.163***	0.017	-0.146***
Total N	N=277	N=296	N=591			
Work performance	0.340	0.236	0.358	0.104**	-0.018	-0.122***
Total N	N=279	N=284	N=601			
Physical strength	0.398	0.435	0.304	-0.037	0.094**	0.131***
Total N	N=279	N=290	N=595			
Beauty	0.348	0.169	0.266	0.179***	0.082**	-0.097**
Total N	N=319	N=267	N=576			
Social media followers	0.225	0.120	0.150	0.105***	0.075**	-0.030
Total N	N=315	N=299	N=546			

*** $p<0.001$, **$p<0.01$, *$p<0.05$

Table 9. Female sample - Gender information treatment. Share of positional answers across domains. Two-sample proportion tests

Domain	Gender of referent others			Differences		
	Same gender (S)	Opposite gender (O)	No info (N)	(S)-(O)	(S)-(N)	(O)-(N)
Income	0.139	0.155	0.276	-0.016	-0.137***	-0.121***
Total N	N=209	N=206	N=439			
Work performance	0.233	0.251	0.418	-0.018	-0.185***	-0.167***
Total N	N=215	N=211	N=428			

[9] The distributions of answers across all alternatives (absolute, egalitarian, etc.) and gender information treatments are available in *Tables A2* and *A3* in the appendix.

Physical strength	0.226	0.130	0.157	0.096***	0.069**	-0.027
Total N	N=226	N=207	N=421			
Beauty	0.312	0.234	0.238	0.078*	0.074*	-0.004
Total N	N=218	N=208	N=425			
Social media followers	0.151	0.151	0.159	0.000	-0.008	-0.008
Total N	N=218	N=219	N=415			

*** p<0.001, **p<0.01, *p<0.05
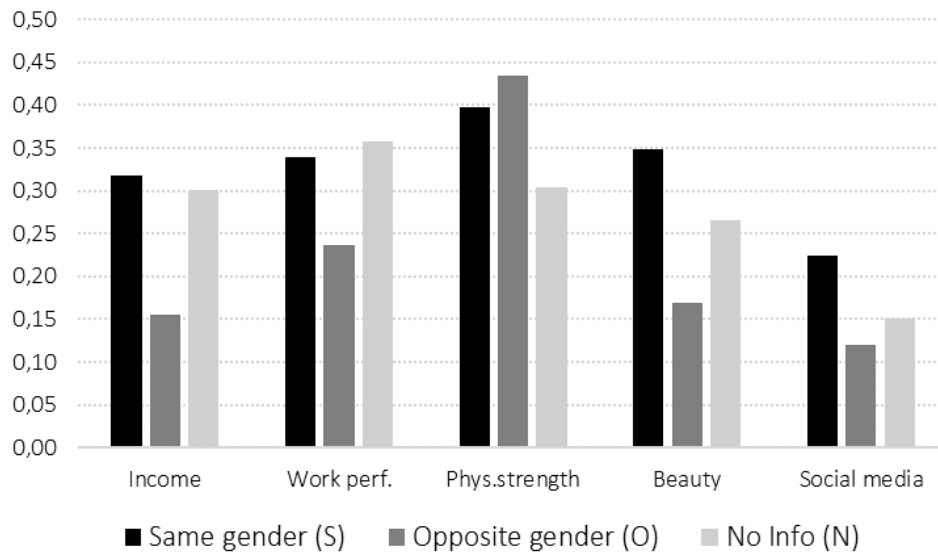
Figure 1. Male sample - Gender information treatment: share of positional answers.
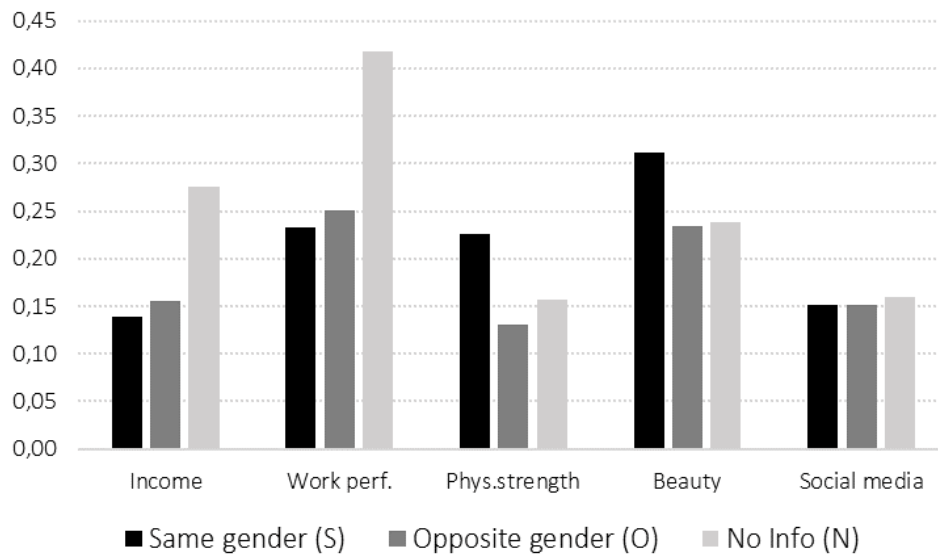
Figure 3. Female sample - Gender information treatment: share of positional answers

The results in *Table 8* show that men were more likely to choose the positional alternative if they compared their income (p<0.001), work performance (p<0.001), beauty (p<0.001), and social media followers (p<0.001) with other men than with women. As can be seen in *Table 9*, we further found that a larger proportion of women displayed positional concerns for beauty (p=0.073) and physical strength (p=0.010) when they compared with other women than when they compared with men. However, we found no effects of gender information on positional choices among women in the other domains, and no evidence that a male reference group made men more positional for physical strength than a female reference group did (p=0.376). Finally, we found that a *smaller* proportion of both men and women displayed positional preferences when they compared income and work performance with women than when they compared with a gender-neutral reference group (p<0.001). The result that women are substantially more likely to express positional concerns when they compare their income and work performance with an unspecified "other", than when they compare with men or women, is very surprising. A possible explanation is that gender information makes the reference group less abstract, and therefore adds a cost to positional choices. In other words, that women express more positional concerns when they compare with an anonymous "other" for the same reason that participants make more positional choices when they compare with an average person in society.

Our result on physical strength can perhaps be explained both by the fact that men, on average, have more muscle mass than women, and by gender norms. Masculine men are expected to be relatively stronger and larger than women, and feminine women are expected to be relatively weaker and smaller than men. Situations, were men are relatively weaker than women, may therefore threaten the self-image of both men and women. As a consequence, the relative attractiveness of the positional alternative may have been higher for men and lower for women when the reference group consisted of the opposite sex, than when it consisted of members of the same sex. This explanation is partly supported by the results in *Table A3* in the appendix, which show that women were more likely to choose the absolute and inferior alternative when they compared physical strength with men, than with women. A potential explanation for why we do not see similar results in the domains income and work performance, is perhaps that these domains are not as gender stereotypical as they once were.

3.4 Positional concerns and social identification

Our last hypothesis **H6**, was that people are more likely to be positional when the activity or consumption is central to their social identity. We created our measurement instruments for social identity by calculating factor scores from confirmatory factor analyses of the Leach et al. (2008) questions. Our analysis showed that all instruments had a Cronbach's alpha above 0.7, and a Keiser-Meyer-Olkin (KMO) test-value above 0.7 (see *Table A5* in the appendix).

To test if the degree of social identification with a domain was associated with positional concerns in that domain, we ran logistic regressions on each of our positionality variables. We present the results in *Table 10*. It should be noted that we only elicited positional preferences for a marginal degree of positionality corresponding to 0.33. Hence, our data does not allow us to analyze the correlation between social identification and the degree of positionality. Instead the results in *Table 10* shows the link between social identification and the probability that an individual has a marginal degree of positionality of at least 0.33.

Table 10. Correlates of positional concerns. Logistic regression. Standard errors in parentheses.

	Income	Work	Physical Strength	Beauty	SoMe
Positional preferences					
Income		0.508***	0.513***	0.588***	0.668***
		(0.116)	(0.122)	(0.122)	(0.140)
Work performance	0.483***		0.509***	0.837***	0.100
	(0.119)		(0.115)	(0.112)	(0.138)
Phys. Strength	0.470***	0.527***		0.690***	0.742***
	(0.126)	(0.115)		(0.120)	(0.141)
Beauty	0.568***	0.812***	0.705***		0.680***
	(0.125)	(0.113)	(0.120)		(0.139)
SoMe	0.716***	0.104	0.726***	0.693***	
	(0.147)	(0.139)	(0.142)	(0.140)	
Social identity factors					
Income	0.431***	0.058	0.039	0.018	-0.095
	(0.084)	(0.073)	(0.079)	(0.080)	(0.097)
Work performance	-0.139	0.041	-0.109	-0.069	0.076
	(0.072)	(0.064)	(0.069)	(0.070)	(0.085)
Gender	-0.040	-0.032	0.242**	0.128	-0.085
	(0.075)	(0.066)	(0.071)	(0.073)	(0.089)
Social popularity	0.010	0.042	0.004	0.142*	0.557***
	(0.069)	(0.062)	(0.066)	(0.067)	(0.082)
Socio-demographics					
Income (log)	0.175**	0.074	-0.007	-0.057	0.005
	(0.062)	(0.055)	(0.059)	(0.060)	(0.071)
Female	-0.151	0.249*	-1.156***	0.086	0.248
	(0.124)	(0.109)	(0.122)	(0.119)	(0.142)

Age	-0.013*	-0.008	-0.008	-0.010	-0.013
	(0.006)	(0.005)	(0.006)	(0.006)	(0.007)
Close-Distant comparison (ref is society)					
Colleagues	-0.937***	-0.323**	-0.473***	-0.338**	-0.172
	(0.134)	(0.122)	(0.134)	(0.129)	(0.154)
Friends	-1.217***	-0.404**	-0.500***	-0.700***	-0.260
	(0.143)	(0.123)	(0.130)	(0.137)	(0.160)
Gender information (ref is no information)					
Female	-0.854***	-0.781***	0.629***	-0.164	-0.246
	(0.153)	(0.130)	(0.129)	(0.140)	(0.167)
Male	-0.198	-0.426***	0.196	0.279*	0.244
	(0.137)	(0.124)	(0.136)	(0.129)	(0.151)
Constant	-1.776***	-1.178**	-0.823	-0.899*	-2.120***
	(0.458)	(0.409)	(0.434)	(0.441)	(0.534)
N	2018	2018	2018	2018	2018
Chi-square	326.02	206.59	316.36	275.74	202.25
Pseudo r-square	0.1451	0.0812	0.1325	0.1187	0.1144

*** $p<0.001$, **$p<0.01$, * $p<0.05$

Our analysis suggests that centrality of income in a participant's social identity predicted positional preferences for income, holding positionality in all other domains constant. None of the other identity variables predicted positional preferences in the income domain. We similarly find that centrality of gender and social popularity predicted positionality for physical strength and followers on social media, respectively. We found 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 by gender effects. *Table A6* and *A7* in the appendix show results from regressions on the male and female subsample, respectively. The results show that women, who felt that being a woman is a central part of their identity, were more likely to be positional about beauty (p=0.027), but not about physical strength (p = 0.925). By contrast, men who identified strongly as men were more likely to be positional about physical strength (0<0.001), but not about beauty (p = 0.546).

Finally, we note that our study replicates previous findings in terms of a positive correlation in positional preferences across domains. The regression results further show that the treatment effects of social closeness and gender information were robust to the inclusion of control variables.

4. Discussion

Why do people care more about social status in some domains than others, and does the intensity of positional concerns depend on with whom people compare? The purpose of this study was to evaluate the role of the reference group and social identification for positional preferences. We hypothesized that positional concerns are linked to the fact that social rank is associated with an evolutionary advantage. We predicted that subjects would be more likely to express positional concerns when they compare with a socially close and relevant reference group, than when they compare with a more abstract and distant reference group. We further theorized that people would be most likely to be positional in domains that are closely connected to valued social identities. Finally, we predicted that men and women would compete more with members of the same sex, and be most positional in gender stereotypical domains, especially when they identify strongly with their gender. We tested our hypotheses on a sample of 2 018 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, we only found limited support for our hypotheses.

Perhaps most notably, our results suggested that subjects were most likely to express positional concerns when they compared with an average person in society, regardless of domain. This result goes against the finding of e.g., Clark and Senik (2010) who found that people compare their income with mostly with colleagues, and Lubbers et al. (2009) who found that pupils intuitively choose friends as a reference point. However, neither of these studies investigated positional behavior. Hence, a possible explanation to our result is that people compare more with, but also care more about, people close to them. This may trigger both positional and altruistic preferences. As a consequence, people may refrain from making choices that would hurt close reference groups. Our data on egalitarian choices added some support for this explanation.

Our analysis related to gender stereotypes partly supported our hypotheses but also indicated that not all domains are gendered. In support for our hypotheses, our within-group analysis showed that men were more positional for physical strength than for beauty, while the opposite held true for women. Our between-group analysis further indicated that men were more positional than women about physical strength and income. Positional preferences for physical strength and beauty were also positively correlated with a strong gender identity

among men and women, respectively. Finally, we found that women were most likely to express positional concerns for beauty when they compared with other women. However, our analysis also produced several results that went against our hypotheses. For example, we found that women were more positional about work performance than about beauty. Our results also showed that women were equally likely to be positional about work performance (traditional masculine domain) as men, and that men were equally likely as women to be positional about beauty (traditional feminine domain). Finally, we found that men were as positional about beauty as they were about income. A potential explanation to these last two findings is that physical appearance can affect outcomes on both the marriage and labor market (Hamermesh and Abrevaya, 2013). In accordance with our results, Hamermesh (Hamermesh and Abrevaya, 2013) found that beauty had relatively large and similar effects on the happiness of both men and women. About half of the increase in wellbeing was explained by improved outcomes on the marriage and job market. Taken together, our results indicate that some gender stereotypical characteristics continue to be important signals of status and induce same-sex competition. However, other domains, which have traditionally been male- or female-dominated, may today be more or less gender neutral.

Our last hypothesis was that people are more likely to care about social status if the domain is linked to a central social identity. Our analysis provided mixed support for this hypothesis. As noted above, we found a significant link between gender identities and positional concerns in strongly gender stereotypical domains. We also found a significant link between social identification and positional preferences for income and social media followers. However, individuals who considered performance at work as an important part of their identity were no more likely to express positional concerns than individuals who deemed this aspect to be unimportant. This result is especially surprising, since our data suggested that work performance is a highly positional domain. A possible explanation for this finding is that relative work performance affects e.g., the probability for getting a raise, a promotion or good references for future work applications. Positional choices in this domain may therefore have been driven both by aspirations for social status and by competition for scarce material resources. This explanation is in line with the hypotheses and findings by Hillesheim and Mechtel (2011) who argued that positional choices in many situations can be explained by non-psychological externalities, i.e., that a relatively better social position affects access to resources in absolute terms.

To avoid that the participants choose the positional alternative for non-positional reasons, choice experiments on positional preferences always include information to participants that everything except the value of consumption is identical in all scenarios. The consumption value in the positional alternative (B) is further always set strictly lower than value in the absolute alternative (A). However, this approach may not prevent participants from perceiving that the characteristics of the different alternatives will indirectly affect current access to other material resources, or future access to the good in question. Concerning work performance, it is possible that our participants felt that their relative performance might affect their future prospects. If they did, then even non-positional participants without a strong professional identity had incentives to choose the positional alternative. Although inconsistent with our specific hypothesis, this explanation is consistent with our overarching hypothesis, i.e., that the quest for social status can be linked to the strive to survive.

The evolutionary source of positional preferences may perhaps also explain why participants were less likely to choose the positional alternative when they compare with a socially close reference group than with a distant one. Even if people evaluate their social rank in their social group by comparing with people close to them, their survival chances also increase if the rank of their social group is relatively high in society. Hence, if an individual improves their social rank within the group but lower the performance of the group this may lower overall survival chances. If positional behavior reflects a general struggle over resources, and that agents use all means to get these resources (their social network, their physical appearance etc.), this implies that positional choices may increase the survival chances of the fittest. Positional preferences will always create negative externalities since the consumption choices of others enter the utility function of positional agents. However, if an agent's relative position gives her a survival advantage, in the form of access to material and reproductive resources, it is not certain that reducing positional choices improves overall efficiency[10].

5. Limitations and implications for future research

The main aim of this study was to test the hypothesis that socially close and relevant referent groups trigger more positional choices than distant and abstract reference groups. We thus designed our experiment to identify differences in effects between different reference groups, and not to find detailed mechanisms underlying the social struggle, or the consequences of

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[10] We are thankful for an anonymous reviewer for pointing this out.

this struggle. Our data therefore does not allow us to test hypotheses related to altruistic preferences towards peers, or efficiency gains from positional competition. Another drawback of our design is that we used hypothetical decision making to tease out preferences. This methodology has its challenges as individuals are likely to overestimate their preferences and willingness to pay (Murphy et al., 2005). We need to take this bias into account when evaluating the applicability and validity of our findings.

It should also be noted that the respondents' own real-life circumstances may have affected their choices in the hypothetical choice scenarios. In our experimental analysis, where we analyzed effects of randomly assigned treatments, unobserved individual heterogeneity is relatively unproblematic. However, it is possible that participants, who in real life had a low level of beauty, work performance etcetera, downplayed both the importance of these characteristics in their overall identity, and the importance to "perform" relatively well in these domains, to avoid negative emotions. As a consequence, the respondents' own circumstances may be systematically correlated with both social identification and positional preferences, and the correlational results in section 3.4 may therefore be biased.[11] However, in a follow-up study, one of the authors of this study included both questions on real-life characteristics and experimentally varied the level in the hypothetical scenarios. She found no significant effects (Mageli, 2021).

We see two important areas for future research: 1) the development of more elaborate theoretical models that allow researchers to analyze under what conditions relative concerns increase or reduce market efficiency, and 2) empirical tests of these models. To enable this, more detailed empirical research on with whom people compete for social status, why, and how this affects their behavior, is needed.

Acknowledgments

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[11] We are thankful to an anonymous referee for pointing this out.

References

[1] Akay, A., & Martinsson, P. (2019). Positional concerns through the life-cycle. *Journal of Behavioral and Experimental Economics, 78*, 98-103. doi:https://doi.org/10.1016/j.socec.2018.12.005

[2] Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development, 40*(2), 428-435. doi:https://doi.org/10.1016/j.socec.2018.12.005

[3] Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics, 115*(3), 715-753. doi:https://doi.org/10.1162/003355300554881

[4] Alpizar, F., Carlsson, F., & Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization, 56*(3), 405-421. doi:https://doi.org/10.1016/j.jebo.2002.10.007

[5] Anderson, C., John, O. P., Keltner, D., & Kring, A. M. (2001). Who attains social status? Effects of personality and physical attractiveness in social groups. *Journal of personality and social psychology, 81*(1), 116. doi:https://doi.org/10.1037/0022-3514.81.1.116

[6] Aronsson, T., & Johansson-Stenman, O. (2008). When the Joneses' consumption hurts: Optimal public good provision and nonlinear income taxation. *Journal of public economics, 92*(5-6), 986-997. doi:https://doi.org/10.1016/j.jpubeco.2007.12.007

[7] Aronsson, T., & Johansson-Stenman, O. (2014). Positional preferences in time and space: Optimal income taxation with dynamic social comparisons. *Journal of Economic Behavior & Organization, 101*, 1-23. doi:https://doi.org/10.1016/j.jebo.2014.01.004

[8] Aronsson, T., & Johansson-Stenman, O. (2010). Positional concerns in an OLG model: optimal labor and capital income taxation. *International Economic Review, 51*(4), 1071-1095. doi:https://doi.org/10.1111/j.1468-2354.2010.00611.x

[9] Aronsson, T., & Mannberg, A. (2015). Relative consumption of housing: Marginal saving subsidies and income taxes as a second-best policy? *Journal of Economic Behavior & Organization, 116*, 439-450. doi:https://doi.org/10.1016/j.jebo.2015.05.011

[10] Balafoutas, L., Kerschbamer, R., & Sutter, M. (2012). Distributional preferences and competitive behavior. *Journal of Economic Behavior & Organization, 83*(1), 125-135. doi:https://doi.org/10.1016/j.jebo.2011.06.018

[11] Barkow, J. H., Akiwowo, A. A., Barua, T. K., Chance, M., Chapple, E. D., Chattopadhyay, G. P., Freedman, D. G., Geddes, W., Goswami, B., & Isichei, P.

(1975). Prestige and culture: a biosocial interpretation [and comments and replies]. *Current Anthropology, 16*(4), 553-572. doi:https://doi.org/10.1086/201619

[12] Barkow, J. H., Cosmides, L., & Tooby, J. (1992). *The adapted mind: Evolutionary psychology and the generation of culture*: Oxford University Press, USA.

[13] Baumeister, R. F., & Leary, M. R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological bulletin, 117*(3), 497. doi:https://doi.org/10.1037/0033-2909.117.3.497

[14] Baumeister, R. F., Reynolds, T., Winegard, B., & Vohs, K. D. (2017). Competing for love: Applying sexual economics theory to mating contests. *Journal of Economic Psychology, 63*, 230-241. doi:https://doi.org/10.1016/j.joep.2017.07.009

[15] Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self-presentational motivations and personality differences in self-esteem. *Journal of personality, 57*(3), 547-579. doi:https://doi.org/10.1111/j.1467-6494.1989.tb02384.x

[16] Bem, S. L. (1981). Bem sex role inventory. *Journal of personality and social psychology*.

[17] Black, K. A. (2000). Gender differences in adolescents' behavior during conflict resolution tasks with best friends. *Adolescence, 35*(139), 499-512. Retrieved from https://pubmed.ncbi.nlm.nih.gov/11130594/

[18] Bonds-Raacke, J., & Raacke, J. (2010). MySpace and Facebook: Identifying dimensions of uses and gratifications for friend networking sites. *Individual differences research, 8*(1). doi:https://doi.org/10.1089/cpb.2007.0056

[19] Bull, C., Schotter, A., & Weigelt, K. (1987). Tournaments and piece rates: An experimental study. *Journal of Political Economy, 95*(1), 1-33. doi:https://doi.org/10.1086/261439

[20] Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*(1), 1-14. doi:https://doi.org/10.1017/S0140525X00023992

[21] Carlsson, F., Gupta, G., & Johansson-Stenman, O. (2008). Keeping up with the Vaishyas? Caste and relative standing in India. *Oxford Economic Papers, 61*(1), 52-73. doi:https://doi.org/10.1093/oep/gpn015

[22] Carlsson, F., Johansson-Stenman, O., & Martinsson, P. (2007). Do you enjoy having more than others? Survey evidence of positional goods. *Economica, 74*(296), 586-598. doi:https://doi.org/10.1111/j.1468-0335.2006.00571.x

[23] Carlsson, F., Nam, P. K., Linde-Rahr, M., & Martinsson, P. (2007). Are Vietnamese farmers concerned with their relative position in society? *The journal of development studies, 43*(7), 1177-1188. doi:https://doi.org/10.1080/00220380701526303

[24] Carlsson, F., & Qin, P. (2010). It is better to be the head of a chicken than the tail of a phoenix: Concern for relative standing in rural China. *The Journal of Socio-Economics, 39*(2), 180-186. doi:https://doi.org/10.1016/j.socec.2010.02.003

[25] Celse, J. (2012). Is the positional bias an artefact? Distinguishing positional concerns from egalitarian concerns. *The Journal of Socio-Economics, 41*(3), 277-283. doi:https://doi.org/10.1016/j.socec.2012.01.002

[26] Clark, A. E., & Senik, C. (2010). Who compares to whom? The anatomy of income comparisons in Europe. *The economic journal, 120*(544), 573-594. doi:https://doi.org/10.1111/j.1468-0297.2010.02359.x

[27] Clark, A. E., Senik, C., & Yamada, K. (2017). When experienced and decision utility concur: The case of income comparisons. *Journal of Behavioral and Experimental Economics, 70*, 1-9. doi:https://doi.org/10.1016/j.socec.2017.07.002

[28] Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior.*

[29] Dunbar, R. I. (2003). The social brain: mind, language, and society in evolutionary perspective. *Annual review of anthropology, 32*(1), 163-181. doi:https://doi.org/10.1146/annurev.anthro.32.061002.093158

[30] Dunbar, R. I., & Shultz, S. (2007). Evolution in the social brain. *Science, 317*(5843), 1344-1347. doi:https://doi.org/10.1126/science.1145463

[31] Eagly, A. H., & Wood, W. (2016). Social role theory of sex differences. *The Wiley Blackwell encyclopedia of gender and sexuality studies, ( )*, 1-3. doi:https://doi.org/10.1002/9781118663219.wbegss183

[32] Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*(1), 35-47. doi:https://doi.org/10.1016/0167-2681(95)00003-B

[33] Frank, R. H. (1985). The demand for unobservable and other nonpositional goods. *The American Economic Review, 75*(1), 101-116.

[34] Frank, R. H. (2005). Are concerns about relative income relevant for public policy? Positional Externalities Cause Large and Preventable Welfare Losses. *The American Economic Review, 95*(2), 137. doi:https://doi.org/10.1257/000282805774670392

[35] Geary, D. C., Vigil, J., & Byrd-Craven, J. (2004). Evolution of human mate choice. *Journal of sex research, 41*(1), 27-42. doi:https://doi.org/10.1080/00224490409552211

[36] Hamermesh, D. S., & Abrevaya, J. (2013). Beauty is the promise of happiness? *European Economic Review, 64*, 351-368.

[37] Hannan, R. L., Krishnan, R., & Newman, A. H. (2008). The effects of disseminating relative performance feedback in tournament and individual performance compensation plans. *The Accounting Review, 83*(4), 893-913. doi:https://doi.org/10.2308/accr.2008.83.4.893

[38] Hillesheim, I., & Mechtel, M. (2011). What makes us want to have more than others? Explaining relative consumption effects of public and private goods. *Explaining Relative Consumption Effects of Public and Private Goods (August 12, 2011)*. doi:https://doi.org/10.2139/ssrn.1672710

[39] Hillesheim, I., & Mechtel, M. (2013). How much do others matter? Explaining positional concerns for different goods and personal characteristics. *Journal of Economic Psychology, 34*, 61-77. doi:https://doi.org/10.1016/j.joep.2012.11.006

[40] Ismail, K. (2018). Social Media Influencers: Mega, Macro, Micro or Nano. Retrieved from https://www.cmswire.com/digital-marketing/social-media-influencers-mega-macro-micro-or-nano/

[41] JATOS. Retrieved from https://www.jatos.org/

[42] Kenrick, D. T., & Keefe, R. C. (1992). Age preferences in mates reflect sex differences in human reproductive strategies. *Behavioral and Brain Sciences, 15*(1), 75-91. doi:https://doi.org/10.1017/S0140525X00067595

[43] Knight, J., Lina, S., & Gunatilaka, R. (2009). Subjective well-being and its determinants in rural China. *China economic review, 20*(4), 635-649. doi:https://doi.org/10.1016/j.chieco.2008.09.003

[44] Kurland, J. A., & Beckerman, S. J. (1985). Optimal foraging and hominid evolution: labor and reciprocity. *American Anthropologist, 87*(1), 73-93. doi:https://doi.org/10.1525/aa.1985.87.1.02a00070

[45] Lazear, E. P., & Rosen, S. (1981). Rank-order tournaments as optimum labor contracts. *Journal of Political Economy, 89*(5), 841-864. doi:https://doi.org/10.1086/261010

[46] Leach, C. W., Van Zomeren, M., Zebel, S., Vliek, M. L., Pennekamp, S. F., Doosje, B., Ouwerkerk, J. W., & Spears, R. (2008). Group-level self-definition and self-investment: a hierarchical (multicomponent) model of in-group identification. *Journal*

of personality and social psychology, 95(1), 144-165.
doi:https://doi.org/10.1037/0022-3514.95.1.144

[47] Lubbers, M. J., Kuyper, H., & Van Der Werf, M. P. (2009). Social comparison with friends versus non-friends. *European journal of social psychology, 39*(1), 52-68. doi:https://doi.org/10.1002/ejsp.475

[48] Luttmer, E. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics, 120*(3), 963-1002.
doi:https://doi.org/10.1162/003355305774268255

[49] Mageli, I. (2021). *Levels and subjects*. Article. School of Business and Economics, UiT Arctic University of Norway. CER working paper series.

[50] Mannberg, A., Hendrikx, J., & Johnson, J. (2021). Risky positioning–social aspirations and risk-taking behaviour in avalanche terrain. *Leisure Studies, 40*(4), 495-512. doi:https://doi.org/10.1080/02614367.2020.1831046

[51] Mannberg, A., & Sjögren, T. (2021). *Social Identity and Risky Leisure Activities – Implications for Welfare and Policy*. School of Business and Economics, UiT Arctic University of Norway. CER Working paper series.

[52] McAdams, R. H. (1992). Relative preferences. *Yale LJ, 102*, 1.
doi:https://doi.org/10.2307/796772

[53] Murphy, J. J., Allen, P. G., Stevens, T. H., & Weatherhead, D. (2005). A meta-analysis of hypothetical bias in stated preference valuation. *Environmental and Resource Economics, 30*(3), 313-325. doi:https://doi.org/10.1007/s10640-004-3332-z

[54] Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and individual differences, 52*(3), 243-249. doi:https://doi.org/10.1016/j.paid.2011.11.007

[55] Senik, C. (2009). Direct evidence on income comparisons and their welfare effects. *Journal of Economic Behavior & Organization, 72*(1), 408-424.

[56] Solnick, S. J., & Hemenway, D. (1998). Is more always better?: A survey on positional concerns. *Journal of Economic Behavior & Organization, 37*(3), 373-383.
doi:https://doi.org/10.1016/S0167-2681(98)00089-4

[57] Solnick, S. J., & Hemenway, D. (2005). Are positional concerns stronger in some domains than in others? *American Economic Review, 95*(2), 147-151.
doi:https://doi.org/10.1257/000282805774669925

[58] Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. *Social psychology quarterly*, 224-237. doi:https://doi.org/10.2307/2695870

[59] Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science, 11*(5), 159-163. doi:https://doi.org/10.1111/1467-8721.00191

[60] Tajfel, H. (2010). *Social identity and intergroup relations* (Vol. 7): Cambridge University Press.

[61] Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. *Advances in Experimental Social Psychology, 21*, 181-227. doi:https://doi.org/10.1016/S0065-2601(08)60227-0

[62] Udry, J. R., & Eckland, B. K. (1984). Benefits of being attractive: Differential payoffs for men and women. *Psychological Reports, 54*(1), 47-56. doi:https://doi.org/10.2466/pr0.1984.54.1.47

[63] Veblen, T. (1899). *The theory of the leisure class*.

[64] Wiederman, M. W. (1993). Evolved gender differences in mate preferences: Evidence from personal advertisements. *Ethology and Sociobiology, 14*(5), 331-351. doi:https://doi.org/10.1016/0162-3095(93)90003-Z

Appendix

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 for all categories. Proportion tests of the effect of reference groups

Domain	Share of answers			Differences		
	Distant	Close				
	Society (S)	Friends (F)	Colleagues (C)	S-F	S-C	F-C
Income						
Absolute	0.232	0.330	0.272	-0.098***	-0.040	0.058*
Positional	0.376	0.150	0.200	0.226***	0.176***	-0.049*
Egalitarian	0.302	0.422	0.436	-0.120***	-0.133***	-0.014
Inferior	0.033	0.026	0.018	0.007	0.015	0.008
N observations	668	533	817			
Work performance						
Absolute	0.215	0.249	0.235	-0.034	-0.020	0.014
Positional	0.385	0.292	0.302	0.093***	0.083***	-0.010
Egalitarian	0.307	0.361	0.372	-0.054*	-0.064*	-0.010
Inferior	0.023	0.012	0.011	0.012	0.012	0.000
N observations	641	675	702			
Physical strength						
Absolute	0.212	0.245	0.237	-0.033	-0.025	0.008
Positional	0.345	0.243	0.251	0.102***	0.094***	-0.008
Egalitarian	0.263	*0.302*	*0.296*	-0.038	-0.033	0.006
Inferior	0.053	0.043	0.040	0.010	0.013	0.003
N observations	646	723	649			
Beauty						
Absolute	0.199	0.293	0.249	-0.093***	-0.050*	0.043
Positional	0.329	0.196	0.264	0.133***	0.065**	-0.068**
Egalitarian	0.286	*0.321*	*0.308*	-0.035	-0.022	0.013
Inferior	0.044	0.029	0.030	0.015	0.014	-0.001
N observations	657	663	698			
Social media followers						
Absolute	0.115	0.148	0.129	-0.033	-0.014	0.019
Positional	0.181	0.140	0.154	0.041*	0.027	-0.014
Egalitarian	0.143	*0.156*	*0.179*	-0.013	-0.037	-0.023
Inferior	0.081	0.063	0.088	0.018	-0.007	-0.025
N observations	714	635	669			

*** $p<0.001$, ** $p<0.01$, * $p<0.05$

40

Table A2. Male sub-sample. Share of answers for all categories. Proportion tests of effects of gender information

	Share of answers			Differences		
	Same gender (S)	Opposite gender (O)	No info (N)	(S)-(O)	(S)-(N)	(O)-(N)
Income						
Absolute	0.325	0.304	0.354	0.021	-0.029	-0.050
Positional	0.318	0.155	0.301	-0.162***	0.017	-0.146***
Egalitarian	0.231	0.439	0.261	-0.208***	-0.030	0.179***
Inferior	0.029	0.020	0.036	0.009	-0.007	-0.015
N observations	277	296	591			
Work performance						
Absolute	0.287	0.289	0.265	-0.002	0.022	0.024
Positional	0.330	0.236	0.358	0.094*	-0.028	-0.122***
Egalitarian	0.301	0.331	0.295	-0.030	0.007	0.036
Inferior	0.018	0.011	0.022	0.007	-0.004	-0.011
N observations	279	284	601			
Physical strength						
Absolute	0.226	0.186	0.274	0.040	-0.048	-0.088**
Positional	0.398	0.434	0.304	-0.037	0.094**	0.130***
Egalitarian	0.265	0.169	0.252	0.096**	0.013	-0.083**
Inferior	0.025	0.021	0.039	0.004	-0.014	-0.018
N observations	279	290	595			
Beauty						
Absolute	0.262	0.401	0.280	-0.139***	-0.018	0.121***
Positional	0.355	0.169	0.266	0.187	0.090**	-0.097**
Egalitarian	0.234	0.221	0.280	0.013	-0.046	-0.059
Inferior	0.028	0.060	0.043	-0.032	-0.015	0.017
N observations	321	267	576			
Social media followers						
Absolute	0.117	0.207	0.133	-0.090**	-0.015	0.075**

Positional	0.225	0.120	0.149	0.105***	0.076**	-0.029
Egalitarian	0.133	0.120	0.138	0.013	-0.005	-0.018
Inferior	0.083	0.104	0.091	-0.021	-0.008	0.013
N observations	315	299	550			

*** p<0.001, **p<0.01, * p<0.05

Table A3. Female sub-sample. Share of answers for all categories. Proportion tests of effects of gender information

	Share of answers			Differences		
	Same gender (S)	Opposite gender (O)	No info (N)	(S)-(O)	(S)-(N)	(O)-(N)
Income						
Absolute	0.244	0.117	0.203	0.128***	0.041	-0.086**
Positional	0.139	0.155	0.276	-0.017	-0.137***	-0.120***
Egalitarian	0.512	0.680	0.428	-0.168***	0.084*	0.251***
Inferior	0.029	0.015	0.016	0.014	0.013	-0.001
N observations	209	206	439			
Work performance						
Absolute	0.209	0.142	0.175	0.067	0.034	-0.033
Positional	0.233	0.251	0.418	-0.019	-0.186***	-0.167***
Egalitarian	0.414	0.512	0.350	-0.098*	0.063	0.161***
Inferior	0.014	0.019	0.007	-0.005	0.007	0.012
N observations	215	211	428			
Physical strength						
Absolute	0.155	0.329	0.202	-0.174***	-0.047	0.127***
Positional	0.226	0.130	0.157	0.095**	0.069*	-0.026
Egalitarian	0.425	0.256	0.375	0.169***	0.049	-0.119**
Inferior	0.049	0.121	0.045	-0.072**	0.004	0.076***
N observations	226	207	421			
Beauty						

Absolute	0.142	0.166	0.191	-0.024	-0.048	-0.025
Positional	0.312	0.232	0.238	0.080	0.074*	-0.005
Egalitarian	0.358	0.370	0.388	-0.012	-0.030	-0.019
Inferior	0.018	0.024	0.024	-0.005	-0.005	0.000
N observations	218	211	425			
Social media followers						
Absolute	0.128	0.091	0.101	0.037	0.028	-0.009
Positional	0.151	0.151	0.158	0.001	-0.007	-0.008
Egalitarian	0.183	0.242	0.177	-0.059	0.006	0.065
Inferior	0.073	0.018	0.072	0.055**	0.001	-0.054**
N observations	218	219	417			

*** p<0.001, **p<0.01, * p<0.05

Table A5. Differences in shares of positional answers between male and female domains, in absolute values. Within-group comparisons (Wilcoxon signed-rank tests).

	Stereotypically female domains			
	Beauty		Social media followers	
	Males	Females	Males	Females
Stereotypically male domains				
Physical strength	0.092***	0.086***	0.198***	0.014
Income	0.000	0.042**	0.106***	0.058***
Work performance	0.053***	0.075***	0.159***	0.175***

***p<0.001, **p<0.01, *p<0.05

Table A6. 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

Table A7. Correlates of positional preferences. Logistic regression. Male subsample. Standard errors in parentheses

	Income	Work	Phys Strength	Beauty	SoMe
Positional preferences					
Income		0.413**	0.492**	0.448**	0.647***
		(0.149)	(0.149)	(0.159)	(0.181)
Work performance	0.384*		0.354*	1.000***	0.391*
	(0.154)		(0.144)	(0.150)	(0.180)
Phys. Strength	0.528**	0.349*		0.878***	0.837***
	(0.154)	(0.143)		(0.151)	(0.178)
Beauty	0.489**	0.926***	0.866***		0.451*
	(0.163)	(0.147)	(0.149)		(0.185)
SoMe	0.672***	0.359*	0.831***	0.464*	
	(0.188)	(0.178)	(0.178)	(0.188)	
Social identification					
Income	0.356**	0.151	0.056	0.047	-0.047
	(0.109)	(0.099)	(0.098)	(0.109)	(0.130)
Work performance	-0.036	-0.069	-0.160	-0.048	0.197
	(0.097)	(0.089)	(0.089)	(0.098)	(0.119)
Gender	0.021	-0.021	0.334***	0.057	-0.006
	(0.093)	(0.085)	(0.085)	(0.095)	(0.115)
SoMe	-0.032	0.022	0.053	0.140	0.465***
	(0.087)	(0.080)	(0.080)	(0.088)	(0.105)
Socio-demographics					
Income (log)	0.179*	-0.004	-0.072	0.007	0.004
	(0.078)	(0.071)	(0.071)	(0.079)	(0.091)
Age	-0.015	-0.004	-0.005	-0.016	-0.011
	(0.008)	(0.007)	(0.007)	(0.008)	(0.009)
Close-Distant comparison (ref is society)					
Colleagues	-1.033***	-0.349*	-0.454**	-0.400*	-0.232
	(0.174)	(0.162)	(0.165)	(0.175)	(0.206)
Friends	-1.297***	-0.306	-0.522**	-0.818***	-0.169
	(0.101)	(0.164)	(0.159)	(0.183)	(0.208)
Gender information (ref is no information)					
Female	-0.831***	-0.632***	0.672***	-0.640**	-0.341
	(0.197)	(0.173)	(0.161)	(0.204)	(0.227)
Male	0.164	-0.197	0.356*	0.504**	0.504**
	(0.173)	(0.163)	(0.164)	(0.167)	(0.194)

Constant	-1.711**	-0.801	-0.470	-1.196*	-2.290**
	(0.578)	(0.529)	(0.523)	(0.577)	(0.685)
N	1164	1164	1164	1164	1164
Chi-square	194.75	119.26	176.03	202.13	132.71
Pseudo r-square	0.1439	0.0816	0.1158	0.1494	0.1285

*** p<0.001, **p<0.01, * p<0.5

Table A8. Correlates of positional preferences. Logistic regression. Female subsample. Standard errors in parentheses

	Income	Work	Phys Strength	Beauty	SoMe
Positional preferences					
Income		0.691***	0.563*	0.783***	0.669**
		(0.193)	(0.221)	(0.197)	(0.229)
Work performance	0.643***		0.728***	0.657***	-0.277
	(0.192)		(0.198)	(0.177)	(0.227)
Phys. Strength	0.469*	0.796***		0.457*	0.576*
	(0.226)	(0.203)		(0.214)	(0.247)
Beauty	0.764***	0.654***	0.434*		0.975***
	(0.202)	(0.180)	(0.215)		(0.215)
SoMe	0.760**	-0.242	0.576*	1.005***	
	(0.240)	(0.227)	(0.250)	(0.218)	
Social identification					
Income	0.546***	-0.096	0.025	-0.073	-0.161
	(0.135)	(0.112)	(0.137)	(0.121)	(0.150)
Work performance	-0.252*	0.171	-0.064	-0.023	-0.015
	(0.110)	(0.095)	(0.115)	(0.102)	(0.127)
Gender	-0.193	-0.002	0.012	0.268*	-0.292*
	(0.130)	(0.108)	(0.132)	(0.121)	(0.146)
SoMe	0.089	0.110	-0.085	0.153	0.704***
	(0.116)	(0.101)	(0.124)	(0.108)	(0.135)
Socio-demographics					
Income (log)	0.208*	0.198*	0.127	-0.156	0.054
	(0.104)	(0.089)	(0.108)	(0.008)	(0.116)
Age	-0.01	-0.012	-0.017	-0.005	-0.021*
	(0.009)	(0.007)	(0.010)	(0.008)	(0.010)
Close-Distant comparison (ref is society)					
Colleagues	-0.787***	-0.316	-0.499*	-0.304	-0.157

	(0.217)	(0.190)	(0.236)	(0.197)	(0.239)
Friends	-1.093***	-0.579**	-0.457*	-0.628**	-0.384
	(0.237)	(0.194)	(0.232)	(0.215)	(0.257)
Gender information (ref is no information)					
Female	-0.868***	-0.954***	0.516*	0.356	-0.090
	(0.247)	(0.201)	(0.220)	(0.201)	(0.250)
Male	-0.824**	-0.779***	-0.173	-0.063	-0.134
	(0.242)	(0.196)	(0.236)	(0.216)	(0.249)
Constant	-2.316**	-1.529*	-2.475**	-0.380	-1.803*
	(0.751)	(0.634)	(0.785)	(0.688)	(0.839)
N	854	854	854	854	854
Chi-square	146.34	110.22	67.53	111.49	91.96
Pseudo r-square	0.1643	0.1017	0.0871	0.1149	0.1251

*** p<0.001, **p<0.01, * p<0.5

Paper II

Mageli, I.

Levels and subject. Are reference levels and targeted subject important for positional preferences?

Manuscript

Levels and subject – Are reference levels and targeted subject important for positional preferences?[†]

Ingvild Mageli[‡]

Are we as positional when we can choose a whole loaf of bread, as we are when we are forced to choose between crumbs? Does it matter if we choose for ourselves or for a relative?

In this study, we used an experimental survey approach to evaluate whether positional preferences are sensitive to variations in reference levels and targeted subject. We based our theories on research from economics and psychology, and we predicted that individuals were more likely to choose the positional option when deciding for relatively higher levels in the hypothetical scenarios. In addition, we predicted that deciding for a future relative would yield a higher share of positional answers, compared to deciding for the self. We measured positional preferences with five questions covering four domains – income, housing, vacation and SAT (Scholastic Aptitude Test) score (measuring skills in core areas) – and test our hypotheses on a large representative sample from the US (N=1300). As social demographic indicators, we included information about gender, birth year, children or grandchildren, individual income, vacation days, size of home and self-reported SAT score. Our results suggest that the methods commonly used to elicit positional preferences are relatively insensitive to variations in consumption levels and targeted subject. Second, our results suggest that people are significantly more likely to choose the positional option for housing (size of house) and income when they choose for a grandchild than when they choose for themselves.

1. Introduction

Values matter! The level of our wage enables our consumption, and the score in our exam opens up possibilities for education. According to classical economic theory, rational agents maximize their individual utility by maximizing absolute values (e.g. performance, consumption) However, an emerging aspect in behavioral economics confirms that our personal well-being is affected by how much we have in comparison to referent others, and not only by what we have in isolation (Duesenberry, 1949; Easterlin, 1995; Veblen, 1899). When we no longer care only about our absolute consumption, but also our relative consumption, we are, by definition, positional (Alpizar et al., 2005; Aronsson and Johansson-Stenman, 2014; Carlsson et al., 2008; Carlsson et al., 2007; Clark and Senik, 2010; Clark et al., 2017). What is even more interesting is that these preferences are not only exclusive to the industrialized countries, as evidence suggests that individuals in poor societies display positional concerns as well (Akay, Martinsson and Medhin, 2012; Akay, Martinsson, Medhin, et al., 2012; Yang et al., 2016).

Previous research suggests that a large share of the population holds positional preferences, and we have important insights on how individual decisions vary with domain (e.g. Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). In this setting, the term "domain" defines what the individuals are deciding on, such as income, vacation days, intelligence, etc. The literature suggests that people are more positional for visual status goods (e.g. cars and houses), and personal characteristics (e.g. intelligence and attractiveness) compared to leisure and public goods domains (Alpizar et al., 2005; Carlsson et al., 2007; Hillesheim and Mechtel, 2013). To sum up, the degree of positionality appears to vary with the consumption domain (Carlsson et al., 2007). The extent to which these different domains are studied also varies, with heavy focus on income and leisure time, and less on physical attractiveness, intelligence and public goods (e.g. Alpizar et al., 2005; Bogaerts and Pandelaere, 2013; Carlsson et al., 2008; Celse, 2012; Grolleau, Mzoughi, et al., 2012; Hillesheim and Mechtel, 2012; Hillesheim and Mechtel, 2013). We want to signal success through our social standing, and we compare ourselves to those similar in attributes and performance (Clark and Oswald, 1996; Luttmer, 2005). When we internalize positional preferences in our decisions, this may have an effect on our individual well-being. (Clark and Oswald, 1996; Luttmer, 2005).

A common approach to eliciting positional preferences is to ask subjects to choose between two hypothetical states of the world (e.g. Bogaerts and Pandelaere, 2013; Grolleau, Mzoughi,

et al., 2012; Solnick and Hemenway, 1998). In the first state (A), the subject has a high level of consumption in absolute terms but a low level in relative terms because everybody else has an even higher level of consumption. In the second state (B), the subject has a lower level of consumption compared to the first state, but they have a higher level of consumption in absolute terms. In both situations, they compare themselves to an average in society (e.g. Alpizar et al., 2005; Carlsson et al., 2007) or unspecified others (Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). This constitutes the reference group or person. By definition, subjects choosing the second state are positional, because they are willing to give up consumption to have more than people have in the reference group.

To the best of our knowledge, only a few studies include more than one level of consumption in the choice scenarios (Celse, 2012; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 2005). However, although the results suggest that the share of positional answers increases when the reference level of consumption is higher, none of these studies formally evaluate the effect. Furthermore, these studies only cover income (Celse, 2012; Solnick and Hemenway, 2005) and vacation (Celse, 2012; Grolleau, Mzoughi, et al., 2012), none of them randomized the order of presentation. Regarding the targeted subject, we have not come across any studies analyzing how a variation affects the results. With our study, we want to explore whether these results are robust by measuring how the variation in levels and targeted subject affect positional preferences for income as well as for size of house, size of apartment, SAT-test scores and paid vacation days.

When asking participant to choose the preferred state, researchers use the self as the target. However, some researchers argue that it is better to decide for a child (Celse, 2012) or a relative (Alpizar et al., 2005; Carlsson et al., 2008; Johansson-Stenman et al., 2002), because it may be difficult for respondents to disregard their current circumstances. To the best of our knowledge, no existing studies have explored whether there are significant effects from choosing one over the other. There are several reasons for why it may be better to choose for a child or a relative, than for oneself. One reason put forward in the literature is that when we choose for ourselves, we compare the consumption levels in the scenarios to our own current and past consumption levels, and that this may bias the results. Another potential reason for why choices may not represent true preferences when participants choose for themselves is that the main emotion related to positionality is envy (Elster, 1998; Festinger, 1954; Hirsch, 1977), and we are very much colored by our own situation when we make decisions. We are

envious of those who have more than us, as we know we will most likely never reach the same heights (Suls et al., 2002).

If we instead choose for a relative, this enables us to liberate ourselves from our current circumstances and observe the situation objectively (Alpizar et al., 2005; Carlsson et al., 2008). We want what is best for our relative, and when deciding for them, we are not framed by our own circumstances. When we choose for a relative, we can display our positional preferences without fear of appearing envious. When we are not bound by our own reference points (our wage, vacation days), the positional alternatives become more salient if the subject in decision-making is a future relative.

"Social status" is a term we use to define where we are on the social ladder. According to Hirsch (1977), the term "positionality" came into existence as individuals competed for the top positions in society. With more people than positions, scarcity createsexclusiveness. However, as people strive to reach the top, there are psychological mechanisms creating incentives to engage in conspicuous consumption in order to achieve this goal and therefore create market failures and eventually welfare losses (Frank, 2005; Rauscher, 1997). This may seem optimal to the individual, but it is suboptimal to society.

When you have more money, you have more to spare. According to Maslow's hierarchy of needs we seek recreation after ensuring our fundamental needs are met (Maslow, 1943). We predicted that the share of positional preferences is larger for the higher, than for the lower consumption levels. From economic theory, our marginal utility from one additional unit of consumption diminishes when our absolute level of consumption increases. It is less costly to choose the positional alternative at higher levels because it hurts less to lose a little bit when you have a lot in the first place. However, at higher levels, you have to give up more the be relatively better off, eliminating the effect from high values in the first place Equally, when you perform well at higher levels, the marginal increase in relative advantage may have a negligible effect at individual utility because you are already performing at the top level This is why we expect to see a higher share of positional answers for high values, because the loss in performance is small relative to the endowment in each alternative.

However, although a number of studies show the degree of positionality to be sensitive to the type of consumption (i.e. domain), no previous study has investigated whether positional

concerns vary with the level of consumption. Similarly, although some researchers (Alpizar et al., 2005; Carlsson et al., 2007) argue that the targeted subject (i.e. for whom we choose) can affect positional choices, to date no one has tested whether this is true. We attempt to fill this gap, by randomizing the targeted subject in decision-making. Half the sample decided for themselves, whereas the second half decided for a grandchild.

It is important to extend the insight on reference levels and subject, and their influence on positional preferences, because we have to ensure robustness of our instrument. If we are to trust the results from our studies, we need to trust the instruments we use. This study is an important contribution to future studies in two distinct ways. First, we provide evidence of how variation in level affects the share of positional answers, and second, how these answers vary with the subject in decision-making. This study provides evidence of the robustness of the favored tools in research on positional preferences. If we are to trust the results, we need to trust the methods we use. Even though our main hypotheses revolve about positional preferences, we also comment on the effect of our treatments on preferences for egalitarian and absolute consumption

We structure the article as follows: Section 2 presents the data, sample and treatments, Section 3 the results from the survey and analysis, and Section 4 concludes by discussing future implications of the findings.

In accordance with good science ethics, and to facilitate replications, the study is preregistered in Open Science Framework.[3] This research received no specific grant from funding agencies in the public, commercial or not-for-profit sectors.

2. Materials and Method
2.1 Hypotheses
This study tests whether positional concerns vary with the targeted subject and with different reference levels with two distinct hypotheses.

H1: *The share of positional answers increases when the reference levels of consumption increase.*

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[3] https://osf.io/3wezj

H2: *The share of positional answers increases when individuals make decisions for a distant relative rather than for themselves.*

2.2 Participants

We sent out the survey to 1300 US individuals, using a representative sample recruited through Prolific Academics.[4] To ensure anonymity, we distributed the survey using JATOS.[5] Those who completed the survey were compensated with an hourly payment of GDP 7.5, defined as "good" by Prolific. A total of 1119 (86 percent)[6] provided complete and valid answers.

In the sample, 50 percent identify as male and 50 percent as female. The mean monthly income before taxes was between USD 3001 and USD 4000, 63 percent had a university degree, and the average participant was born in 1975. We did not distinguish between types of university degree, which is why this educational level might seem higher than normal. Of the sample. 57 percent had children, and 19 percent had grandchildren. Only 9 percent of the sample were students. The average size of home was about 1400 square feet, and the average individual reported 10 days of paid vacation each year. For those who reported taking a SAT test (60 percent), the average score was 1100.

2.3 Design and method

The survey consisted of two sections. In the first section, the participants evaluated a set of hypothetical choice scenarios aimed at eliciting positional preferences. All choice scenarios had three states of the world (Absolute, Relative, and Egalitarian), as well as an option to refrain from answering. Since each participant evaluated only one treatment per domain there were no overlapping observations for different treatments within the same domain. Each participant received only one question per domain. To avoid ordering effects, we randomized the order in which we presented the domains. Some researchers also include a third state (C), in which the subject has the same amount as in the second state and equally as much as the reference group, to rule out egalitarian preferences (e.g. Celse, 2012; Celse et al., 2017;

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[4] England-based panel recruiting participants all over the world to partake in studies for a compensation.
[5] JATOS (Just Another Tool for Online Studies) is an open-source software, which allows researchers to recruit participants via e.g. Prolific Academics or Amazon Turk, without revealing individual answers to these sites (https://www.jatos.org/).
[6] . In the study, it was possible to respond "I don't want to answer" to every question, although we omitted these observations from the final sample.

Grolleau, Ibanez, et al., 2012). Since we do not want to label individuals as positional when they are not, we also included this third state in our study design.

2.3.1 Positional preferences and identification

Below is an example question measuring positional preferences for income commonly used in existing studies (e.g. Celse et al., 2017; Grolleau, Mzoughi, et al., 2012; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005):

- State A: You have 100,000 in yearly wage, others on average have 200,000

- State B: You have 50,000 in yearly wage, others on average have 25,000

- State C: You have 50,000 in yearly wage, others on average have 50,000

This approach makes it possible to calculate the marginal degree of positionality using only the values in A and B. It is common to use either a ratio comparison utility function, $u_i = (x_i, x_i/\bar{x})$ or an additive comparison utility function, $u_i = (x_i, x_i - \bar{x})$. In both expressions, the individual level of consumption is x_i, and $\bar{x}$ is the average level of consumption in society (Carlsson et al., 2007).

If we define an individual's utility (u_i) as a function of both their absolute level of consumption (x_i) and her/his relative level of consumption (Δ_i), we can define the marginal degree of positionality (γ) as in the fraction below.

$$\gamma = \frac{\frac{\partial u_i}{\partial \Delta_i}\frac{\partial \Delta_i}{\partial x_i}}{\frac{\partial u_i}{\partial x_i} + \frac{\partial u_i}{\partial \Delta_i}\frac{\partial \Delta_i}{\partial x_i}} \tag{1}$$

If we assume that the utility function is additively separable and linear (e.g., $u_i(x_i, \Delta_i) = x_i + \gamma \cdot (x_i - \bar{x})$), this approach makes it possible to calculate the marginal degree of positionality using only the values in A and B, as represented by equation (2):

$$\gamma = \frac{Subject_{absolute\ (A)} - Subject_{positional(B)}}{Reference_{absolute(A)} - Reference_{positional(B)}} \tag{2}$$

In the numerator, the "subject$_{absolute\ (A)}$" is the individual endowment in the first alternative, and "subject$_{posiitonal\ (B)}$" is the individual endowment in the section alternative. With the

example from earlier studies above, this gives 100,000 in the first option, and 50,000 in the second option, with a difference of 50,000. In the denominator, the "reference$_{absolute (A)}$" is the amount endowed to the reference group in the first alternative, and "reference$_{posititonal (B)}$" is the endowment of the reference group in the second alternative. With 200,000 in the first scenario, and 25,000 in the second scenario, the difference is 175,000. The fraction in equation (2) then gives us the following:

$$\gamma = \frac{100\,000 - 50\,000}{200\,000 - 25\,000} = \frac{50\,000}{175\,000} = 0.285 \tag{3}$$

With this example, the marginal degree of positionality is 0.285. This is the same formula used by Carlsson et al. (2008) and Alpizar et al. (2005). In this study, we use γ equal to 0.33 for all positionality questions, and all level treatments.

2.3.2 Level treatment

To test whether the share of positional answers is sensitive to the level of consumption, we used three different levels in each domain: low, medium and high. The values we use in the domains SAT-scores, vacation days and income are doubled between the low and medium treatment, and then doubled again between the medium and high treatment. For the domains size of house and size of apartment, we triple the amounts between the treatments. This makes the values we use both realistic and attainable. We chose the low level to represent a level just above subsistence level. More specifically, the low level for income is slightly higher than the minimum wage in the US in 2021 ($7.25[7] an hour). To construct the values in the medium and high treatment, we doubled this amount.

In the housing domain, we asked about both the size of house and size of apartment, with the lowest level for the latter at 500 square feet. In the US, the average size of new apartments in 2018 was 950 square feet, and we consider anything below 300 square feet as unlivable.[8] The main difference between the two questions is the framing: In the question on house both the subject and their family live in the house, but in the apartment scenario, the subject lives alone. Looking at the share of adults living alone, there is a higher share of single-person

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[7] https://www.statista.com/statistics/238997/minimum-wage-by-us-state/ on May 4th 2021.
[8] https://www.apartmenttherapy.com/what-is-considered-a-small-apartment-243701 on November 19th 2020.

households in urban areas compared to rural areas.[9] This is why the values on house size exceed those of apartments. We tripled the values between the low and medium, and the medium and high for both house and apartment domains.

The values we use in our treatments are not random. In order to find a suitable low-level value for SAT scores, we use 325 as the individual endowment in the positional option. The maximum score is 1600 and the average score in 2020 was 1051.[10] Due to the construction of the test, a score lower than 200 is almost impossible. If you have a score above 1200, you are in the top percentile and you are likely to get access to the best schools in the field you desire. Finally, for paid vacation days we use 10 days as the minimum value. In the US, there is no federal law stating that employees are entitled to paid vacation days. Moreover, 25 percent of workers do not receive any paid vacation at all.[11] If you work in the private sector, the average amount of paid vacation or holiday is 10 days. The medium and high levels represent two times and four times the value in the low level, respectively.

Below, we show an example of the level treatment in the income domain, when subjects answer for themselves. Alternative B represents the positional alternative and alternative C represents egalitarian preferences.

Prices and purchasing power are the same in all alternatives. The only difference is the monthly earnings. In which of these states, do you think you would feel most satisfied?

Low level	Medium level	High level
You earn **USD 2,000** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes	You earn **USD 4,000** before taxes every month. In society, people earn on average **USD 4,600** each month before taxes	You earn **USD 8,000** before taxes every month. In society, people earn on average **USD 9,200** each month before taxes
You earn **USD 1,700** before taxes every month. In society, people earn on average **USD 1,400** each month before taxes	You earn **USD 3,400** before taxes every month. In society, people earn on average **USD 2,800** each month before taxes	You earn **USD 6,800** before taxes every month. In society, people earn on average **USD 5,600** each month before taxes
You earn **USD 1,700** before taxes every month. In society, people	You earn **USD 3,400** before taxes every month. In society, people	You earn **USD 6,800** before taxes every month. In society, people

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[9] https://www.census.gov/library/stories/2019/10/older-population-in-rural-america.html on March 2nd 2021.
[10] https://insights.collegeconfidential.com/average-sat-score on March 2nd 2021.
[11] https://www.cbsnews.com/news/one-in-four-workers-in-us-dont-get-any-paid-vacation-time-or-holidays/ on November 19th 2020.

earn on average **USD 1,700** each month before taxes.

earn on average **USD 3,400** each month before taxes

earn on average **USD 6,800** each month before taxes

In the previous subsection, we presented the fraction of how we calculate the marginal degree of positionality. With the low-level example, we use the values in alternative A (absolute) and alternative B (positional) and substitute in equation (4):

$$\gamma = \frac{2\,000 - 1\,700}{2\,300 - 1\,400} = 0.33 \tag{4}$$

This gives a marginal degree of positionality equal to 0.33, which is the same gamma value we used in all treatments and domains. We present the full set of values in *Table 1* below. There was also a third option, the egalitarian alternative. The values in this scenario were always the same as in the positional alternative, and both the subject and the reference received the same amount. Sections A.1.1 to A.1.5 in the appendix presents all the positionality questions in our study.

Table 1: Treatments

		Society A (absolute)			Society B (positional)		
		Low	Medium	High	Low	Medium	High
SAT score	Subject	350/1600	700/1600	1400/1600	325/1600	650/1600	1300/1600
	Reference	375/1600	750/1600	1500/1600	300/1600	600/1600	1200/1600
House	Subject	1500 sq.ft.	4500 sq.ft.	13500 sq.ft.	1350 sq.ft.	4050 sq.ft.	12150 sq.ft.
	Reference	1650 sq.ft.	4950 sq.ft.	14850 sq.ft.	1200 sq.ft.	3600 sq.ft.	10800 sq.ft.
Apartment	Subject	500 sq.ft.	1500 sq.ft.	4500 sq.ft.	400 sfqt	1200 sq.ft.	3600 sq.ft.
	Reference	600 sq.ft.	1800 sq.ft.	5400 sq.ft.	300 sq.ft.	900 sq.ft.	2700 sq.ft.
Vacation	Subject	12 days	24 days	48 days	10 days	20 days	40 days
	Reference	14 days	28 days	56 days	8 days	16 days	32 days
Income	Subject	USD 2000	USD 4000	USD 8000	USD 1700	USD 3400	USD 6800
	Reference	USD 2300	USD 4600	USD 9200	USD 1400	USD 2800	USD 5600

2.3.3 Subject treatment

To test whether the share of positional answers is sensitive to whom the respondent answers for, we used two types of targeted subject: the self, and a grandchild. We randomized this treatment across participants, such that a participant only answered questions for themselves as the targeted subject or for a grandchild, in all domains. The motivation for keeping the subject-treatment constant across domains was twofold. First, we wanted to avoid participants answering for the "wrong" subject. Since both the level and type of consumption varied

between domains, it is possible that some participants would have missed that the subject changed as well. The second reason for not randomizing the subject across domains was to avoid participants noticing the treatment and changing their answers due to this. We present an example of how we differentiate between the subject treatments below:

A stable home is essential to ensure quality of life. Regardless of whether you live alone or with your family, or whether it is on a permanent basis or only temporary. In which of these states do you think you would feel most satisfied?

<center>Self</center>	<center>Grandchild</center>
You and your family have a house that is **1,500 square feet** large. In society, the average size of people's houses is **1,650 square feet**.	Your grandchild and family have a house that is **1,500 square feet** large. In society, the average size of people's houses is **1,650 square feet**.
You and your family have a house that is **1,350 square feet** large. In society, the average size of people's houses is **1,200 square feet**.	Your grandchild and family and family have a house that is **1,350 square feet** large. In society, the average size of people's houses is **1,200 square feet**.
You and your family have a house that is **1,350 square feet** large. In society, the average size of people's houses is **1,350 square feet**.	Your grandchild and family have a house that is **1 350 square feet** large. In society, the average size of people's houses is **1,350 square feet**.

After completing the section on positionality, the participants answered questions on background characteristics, including reported income level, home size, vacation days, SAT-scores, age, number of children and number of grandchildren. *Section A.1.2* in the appendix presents the full set of demographic indicators.

2.3.4 Questions not related to analysis

In addition to the main sections we included two sets of questions as a pretest analysis. The first one was the Satisfaction With Life Score (SWLS) by Diener et al. (1985), which is a five-component model measuring general wellbeing with life. The second set was *positionality of others* established by Grolleau, Mzoughi, et al. (2012), measuring what individuals believe others to be preferring for income and size of house. We present both these sets of questions in *section A.3* in the appendix. Since the participants completed these questions after the main sections, and it was impossible to go back to an earlier question, this pretest did not influence the survey results.

3. Results and Analysis

3.1 Descriptive statistics

During the survey, it was possible to refrain from answering the positionality questions, and we omitted these observations from the final analysis. However, to check whether these individuals differed from the remaining sample for reported values on SAT score, home size, vacation days and income, we ran a set of binary tests to compare their answers. These findings suggest that the "no answer" individuals are not that different from those choosing the positional or the absolute option. We present the test statistics in *Table B1* in the appendix.

For the final sample, without the "no answer" observations, *Table 2* displays the distribution of answers, pooled across both treatments. As can be seen in the table, the share of positional answers ranges from about 22 percent for apartment to 55 percent for SAT score; 43 percent chose the positional alternative for income, while 25 percent of participants are positional about vacation and house. The share of egalitarian answers ranges from 19 percent for SAT score to 38 percent for housing.

Table 2: Response categories pooled across treatments

	Absolute	Positional	Egalitarian	Sum
SAT	26.72 %	54.51 %	18.77 %	100.00 %
House	37.35 %	24.66 %	37.98 %	100.00 %
Apartment	47.10 %	21.72 %	31.19 %	100.00 %
Vacation	41.91 %	24.58 %	33.51 %	100.00 %
Income	32.44 %	42.54 %	25.02 %	100.00 %

We present the distribution of positional answers across treatments in *Table 3*. The first column in each panel represents the total number of participants exposed to the treatment, and the second column shows the share of participants who chose the positional alternative.

Table 3: Share of positional answers sorted on both levels and subject treatment. The number in the left column displays how many participants were exposed to the treatment

DOMAIN & LEVEL		SUBJECT TREATMENT					
		ALL		SELF		GRANDCHILD	
TREATMENT		N	% PP	N	% PP	N	% PP
SAT test	All	1119	54.51%	570	55.09%	549	53.92%
	Low	366	58.47%	183	59.02%	183	57.92%
	Medium	373	52.55%	200	55.00%	173	49.71%

	High	380	52.63%	187	51.34%	193	53.89%
House	All	1119	24.66%	570	22.11%	549	27.32%
	Low	351	23.93%	181	22.10%	170	25.88%
	Medium	389	26.22%	197	23.86%	192	28.65%
	High	379	23.75%	192	20.31%	187	27.27%
Apartment	All	1119	21.72%	570	19.82%	549	23.68%
	Low	365	21.64%	188	22.87%	177	20.34%
	Medium	391	19.95%	199	18.09%	192	21.88%
	High	363	23.69%	183	18.58%	180	28.89%
Vacation	All	1119	24.58%	570	22.63%	549	26.59%
	Low	391	22.51%	192	16.67%	199	28.14%
	Medium	369	26.29%	197	25.89%	172	26.74%
	High	359	25.07%	181	25.41%	178	24.72%
Income	All	1119	42.54%	570	39.30%	549	45.90%
	Low	368	39.67%	185	37.84%	183	41.53%
	Medium	352	42.61%	175	38.29%	177	46.89%
	High	399	45.11%	210	41.43%	189	49.21%

The descriptive statistics in *Table 3* do not reveal a large variation in answers across treatments. In most cases, the share of positional answers is slightly higher when the targeted subject is a grandchild as compared to self. The SAT scores constitute an exception to this, with the same trend for both subject treatments, with a decreasing share of positional answers between level treatments. In *tables B2–B6* in the appendix, we present the distribution across all responses, sorted on either level treatments or the subject treatment. To check whether these changes are significant, we ran a set of binary tests on the share of positional answers for each level treatment. We report on the results in *tables 4* and *5*.

Table 4: Results from unpaired t-test on differences in positional responses sorted on level treatments. P-values in parentheses

Domain	Low (1)	Medium (2)	High (3)	(1)–(2)	(2)–(3)	(1)–(3)
SAT score	0.5847	0.5255	0.5263	0.0592	-0.0008	0.0584
	N = 214	N = 196	N = 200	(0.106)	(0.982)	(0.109)
House	0.2393	0.2622	0.2375	-0.0229	0.0247	0.0018
	N = 84	N = 102	N = 90	(0.474)	(0.429)	(0.953)
Apartment	0.2164	0.1995	0.2369	0.0169	-0.0374	-0.0205
	N = 79	N = 78	N = 86	(0.567)	(0.214)	(0.510)

Vacation	0.2251	0.2629	0.2507	-0.0378	0.0122	-0.0256
	N = 88	N = 97	N = 90	(0.225)	(0.411)	(0.701)
Income	0.3967	0.4261	0.4511	-0.0294	-0.025	-0.0544
	N = 146	N = 150	N = 180	(0.424)	(0.4917)	(0.128)

Table 5: Results from unpaired test on differences in responses sorted on subject treatments. P-values in parentheses.

Domain	Self (1)	Grandchild (2)	(1)–(2)
SAT score	0.5509	0.5392	0.0117
	N = 314	N = 296	(0.694)
House	0.2210	0.2732	-0.0522
	N = 126	N = 150	(0.043)
Apartment	0.1982	0.2368	-0.0386
	N = 113	N = 130	(0.118)
Vacation	0.2263	0.2659	-0.0396
	N = 129	N = 146	(0.124)
Income	0.3330	0.4590	-0.1260
	N = 224	N = 252	(0.026)

As can be seen in *tables 4* and *5*, our bivariate analyses do not produce significant differences between the different treatment groups. However, the results from the binary tests on the differences from the subject treatments shows us that the share of positional answers in domains size of house and income are significantly different from one another.

3.2 Econometric analysis

3.2.1 Hypotheses testing

To evaluate whether the level of consumption (**H1**) and targeted subject (**H2**) affect the probability that a participant chooses the positional alternative, we ran a logistic regression on each domain separately. The outcome variable in these regressions takes the value one if the individual chose the positional alternative, and zero otherwise. We evaluate the effect of targeted subject with a dummy variable taking the value one if the participant chose for a grandchild and zero if the participant chose for self. The reference level for the level treatment is the low level.

To investigate whether the participants' own circumstances affect their answers, we included a dummy variable taking the value one if the participant had children and one if they had grandchildren, respectively. In addition to this, we interacted the reported values with the

treatment variable. . We also included a dummy variable to test if participants' own circumstances in relation to the hypothetical scenario, affected the probability that the participant chose the positional alternative. This dummy variable took the value one if a participant's self-reported values were in a higher interval than the participant's level in alternative B in the hypothetical scenario. We interacted this variable with the reported values as well as for the relevant domain. In the regression, we estimated the marginal effects and report on the total effect from these variables. We present the results in *Table 6*, below.

Table 6: Correlates of positional preferences for each domain. Logistic regression with marginal effects. Standard errors in parentheses.

	SAT score	House	Apartment	Vacation	Income
Level treatment (low is baseline)					
Medium	-0.065	-0.001	-0.008	0.069	0.020
	(0.057)	(0.033)	(0.031)	(0.044)	(0.042)
High	-0.050	-0.003	0.025	0.047	0.054
	(0.080)	(0.036)	(0.034)	(0.042)	(0.049)
Subject treatment					
Grandchild	-0.016	0.057*	0.040	0.039	0.064*
	(0.030)	(0.026)	(0.025)	(0.026)	(0.029)
Gender (male is baseline)					
Female	0.037	0.037	0.007	0.033	0.009
	(0.031)	(0.027)	(0.025)	(0.027)	(0.030)
Socio-demographics					
Higher interval	0.015	-0.041	0.021	-0.004	0.032
	(0.056)	(0.034)	(0.031)	(0.043)	(0.040)
Have children	0.006	-0.075*	-0.035	0.012	-0.001
	(0.036)	(0.031)	(0.025)	(0.031)	(0.035)
Have grandchildren	-0.001	-0.035	0.051	-0.036	-0.042
	(0.046	(0.040)	(0.041)	(0.040)	(0.045)
SAT (0 if not taken)	0.007*	0.000	0.003	0.000	0.007*
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Size of home	0.008	0.004	0.003	0.002	0.007
	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)
Vacation days	-0.001	0.005	0.005	-0.004	0.012
	(0.006)	(0.007)	(0.007)	(0.009)	(0.008)
Income	0.001	0.004	0.003	0.007	0.001
	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)
Age	-0.002*	-0.004***	-0.002*	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1119	1119	1119	1119	1119
pseudo R^2	0.0161	0.0283	0.0202	0.0138	0.0176
chi2	24.81	35.38	23.62	17.17	26.87

As can be seen in *Table 6*, the results suggest that neither a medium nor a high reference level had a significant effect on the share of positional preferences for any domain. This contradicts the predictions from **H1**. Individuals deciding for a grandchild are more likely to choose the positional option for the question on size of house (5.7 percentage points) and income (6.4 percentage points), which is in line with **H2**. In the introduction, we discussed why we expected to find significant effects from the grandchild treatment, and although our results are less significant than initially theorized, they are still interesting.

Similarly, the effect of having children or grandchildren is insignificant in almost all cases. The exception is a negative effect of having children on the probability of being positional for housing. Regarding the remaining social demographics, the SAT scores appear to be significant for the domains SAT score and income. The values on reported size of home, reported vacation days and reported income are insignificant in all domains. From *Table 6* we observe that older individuals are less likely to be positional for SAT scores, size of house and size of apartment, but with insignificant effect on vacation days and income. In line with existing research (e.g. Akay and Martinsson, 2019), we find no difference between genders.

The results presented above suggest that, in most cases, the conventional positionality instruments currently in use are insensitive to variations in consumption levels and targeted subject. Our findings provide evidence that the targeted subject sometimes matters. To check whether these results are consistent with a less complicated model, we ran the same regression using a linear probability model. *Table B7* in the appendix suggests that they are robust, with similar effects and in the same direction as findings of the logistic regression setup.

3.2.2 Comments on egalitarian and absolute decisions

Since our hypotheses revolved around positional choices, we want to allocate some attention to the egalitarian and absolute choices. In the introduction, we emphasize that some individuals may harbor inequality aversion, and earlier findings suggest that both children and adults preferred an egalitarian distribution over inequality (Davidovitz, 1999; Johansson-Stenman et al., 2001).

In *Table 2,* we presented the share of answers pooled across one treatments, and in *tables B2–B6* in the appendix, we sort the responses across one of the two treatments. To test if the share of egalitarian or absolute answers vary with the treatments, we ran a set of binary test to compare the level and subject treatments for each domain. In *tables B-12 in the appendix*, we present the results from bivariate analysis on the levels and subject treatments on egalitarian and absolute answers.

From the results, we observe that both treatments may have an effect on egalitarian and absolute preferences for size of home. We can also see that a variation in levels had a significant effect on absolute preferences for SAT-score. Finally, a variation in subject had a significant effect on absolute preferences for vacation. These results tells us that levels and subject may matter for egalitarian and absolute preferences, although our results are not entirely consistent.

For our main analysis of positional preferences, we ran five logistic regressions, one for each of the positionality domains. To check how the treatments and the reported values influence the propensity to choose the egalitarian or absolute option, we use the same regression setup with a binary outcome variable. This variable takes the value 1 if the individual chose the egalitarian (absolute) option, and zero if they chose any of the other alternatives. We present the regression results in *tables B13* (egalitarian) and *B14* (absolute) in the appendix.

From these results, we see that the share of egalitarian answers for domain size of house increases for the high level treatment and for the grandchild treatment. Regarding the share of absolute answers, the share decreases for domains size of house, size of apartment and vacation days in the high level treatment. Those who were exposed to the grandchild treatment, were more inclined to choose the absolute option in domain size of house, but less inclined in domains size of apartment and vacation days. Some of the demographic indicators are significant as well. For example, having grandchildren or reporting a higher interval than the treatment have a negative effect on egalitarian answers. In sum, the share of either egalitarian, absolute or positional answers are relatively unaffected by level treatment regardless of domain, but are sometimes affected by the targeted subject.

3.2.3 Subsample analysis

In the main sample, 452 individuals reported to not have taken a SAT score. Some of these individuals might not remember their test score and therefore reported that they did not take the test. Regardless of this, we reran the regressions, using only the subsample of individuals with a reported SAT score (N = 667). We used the same regression setup as for the full sample, and included the same demographic indicators and interactions. We present the finding in *Table B8* in the appendix.

With this setup, the level treatments are still insignificant in all domains. However, the subject treatment proves insignificant as well. Similarly, with the main sample, older individuals tend to be less positional about size of house and size of apartment, and reported SAT score has a negative effect on positionality for vacation days. The reported income is significant in the income domain, but not in any of the others.

4. Discussion and Concluding Remarks

It is important that we acknowledge that positional preferences might be problematic. When we are concerned with our relative standing, our decisions may yield unintended consequences. The aim of this study was to test whether the measurement instruments we use to elicit positional preferences are sensitive to variations in reference levels and targeted subject. The use of a single level when measuring positional preferences is problematic if these preferences are sensitive to the given level of endowment in a particular domain. It is also problematic to use either the self or a grandchild as the targeted subject if we do not know whether one or the other is a better tool to elicit positional preferences. We argue based on two observations. First, different researchers use different levels of consumption, without any motivation for why the specific levels are chosen. It is possible, even plausible, that some choice scenarios represent values that are all equally good, while others represent values all equally bad. Second, different researchers use different subjects. People who use a hypothetical relative make an argument that we are able to disentangle ourselves from our current circumstances when we are not deciding for ourselves. However, we have yet to observe studies that actually test these effects.

In this paper, we tested whether positional answers are sensitive to consumption level and targeted subject in five domains (income, size of house, size of apartment, vacation and SAT-score) on a representative US sample (N=1300) from Prolific Academics. We used an

experimental survey approach with a random assignment of three levels (low, medium and high) and targeted subject (self and grandchild). Furthermore, for each domain there were three possible levels. We used low, medium and high, all chosen based on real-life minimum wage, score, home size or paid vacation, and all randomized between rounds.

Our results indicate that measurement instruments currently used to elicit positional preferences are relatively robust to variations in reference level. The first set of regressions suggests that a variation in level, and interaction with the reported values of the individual, do not have a significant effect on the propensity to choose the positional option. When we interact the individual's own circumstances and treatment, we find that the medium treatment on SAT score is negative and significant. This is the opposite of what we initially hypothesized. In addition, linking the treatment to the reported values, we find little evidence supporting that a participant's current circumstances affect the probability that they choose the positional alternative. This finding is reassuring as it suggests that previous results are valid and replicable.

However, this study also suggests that positional preferences for size of house and income are sensitive to a variation in targeted subject. More specifically, we find that a higher number of individuals choose the positional option when they choose for a grandchild, than when they choose between low values or themselves. These findings may suggest that the target, and to a lesser extent, innate preferences drive positional preferences. This is an important finding, because both income and vacation days are important domains in life and the study of economic behavior. In the logistic regression, we included several socio-demographic indicators, and the results suggest that older individuals are less likely to be positional for SAT score, size of house and size of apartment. We find no effect from having grandchildren, and the effect from having children is negative and significant only for size of house. The latter result holds true only for the regression setup without the matching variable. Our results suggest that reported SAT score has an effect on income, but not on any other domain.

In addition to our main hypotheses, we added some analysis on how a variation in levels or in subject influences the share of egalitarian and absolute answers. The results from bivariate analysis tells us that both levels and subject have a significant effect on egalitarian and absolute preferences for size of home. We also ran the same regressions as for the positionality dummies, and we found that treatment levels are relatively insignificant across

domains. The targeted subject has some effect on both egalitarian and absolute answers in domain size of home, but only on absolute answers in domains size of apartment and vacation days. With this knowledge, it would be interesting if future researchers would pursue this path and further explore what contributes to such variations.

We contribute to the literature by checking whether the preferred methods and instruments in the study of positional preferences are robust to variation in levels and subjects. With an experimental study, our findings suggest that these instruments are relatively insensitive to a variation in level and in targeted subject, and that existing findings can be safely replicated.

The author declares that she has no conflict of interest.

References

[1] Akay, A., & Martinsson, P. (2019). Positional concerns through the life-cycle. *Journal of Behavioral and Experimental Economics, 78*, 98-103. doi:https://doi.org/10.1016/j.socec.2018.12.005

[2] Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development, 40*(2), 428-435. doi:https://doi.org/10.1016/j.socec.2018.12.005

[3] Akay, A., Martinsson, P., Medhin, H., & Trautmann, S. T. (2012). Attitudes toward uncertainty among the poor: an experiment in rural Ethiopia. *Theory and Decision, 73*(3), 453-464.

[4] Alpizar, F., Carlsson, F., & Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization, 56*(3), 405-421. doi:https://doi.org/10.1016/j.jebo.2002.10.007

[5] Aronsson, T., & Johansson-Stenman, O. (2014). Positional preferences in time and space: Optimal income taxation with dynamic social comparisons. *Journal of Economic Behavior & Organization, 101*, 1-23. doi:https://doi.org/10.1016/j.jebo.2014.01.004

[6] Bogaerts, T., & Pandelaere, M. (2013). Less is more: Why some domains are more positional than others. *Journal of Economic Psychology, 39*, 225-236. doi:https://doi.org/10.1016/j.joep.2013.08.005

[7] Carlsson, F., Gupta, G., & Johansson-Stenman, O. (2008). Keeping up with the Vaishyas? Caste and relative standing in India. *Oxford Economic Papers, 61*(1), 52-73. doi:https://doi.org/10.1093/oep/gpn015

[8] Carlsson, F., Johansson-Stenman, O., & Martinsson, P. (2007). Do you enjoy having more than others? Survey evidence of positional goods. *Economica, 74*(296), 586-598. doi:https://doi.org/10.1111/j.1468-0335.2006.00571.x

[9] Celse, J. (2012). Is the positional bias an artefact? Distinguishing positional concerns from egalitarian concerns. *The Journal of Socio-Economics, 41*(3), 277-283. doi:https://doi.org/10.1016/j.socec.2012.01.002

[10] Celse, J., Galia, F., & Max, S. (2017). Are (negative) emotions to blame for being positional? An experimental investigation of the impact of emotional states on status preferences. *Journal of Behavioral and Experimental Economics, 67*, 122-130.

[11] Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of public economics, 61*(3), 359-381. doi:https://doi.org/10.1016/0047-2727(95)01564-7

[12] Clark, A. E., & Senik, C. (2010). Who compares to whom? The anatomy of income comparisons in Europe. *The economic journal, 120*(544), 573-594. doi:https://doi.org/10.1111/j.1468-0297.2010.02359.x

[13] Clark, A. E., Senik, C., & Yamada, K. (2017). When experienced and decision utility concur: The case of income comparisons. *Journal of Behavioral and Experimental Economics, 70*, 1-9. doi:https://doi.org/10.1016/j.socec.2017.07.002

[14] Davidovitz, L. (1999). Choices in Egalitarian Distribution: Inequality Aversion versus Risk Aversion. *LSE STICERD Research Paper*(43).

[15] Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment, 49*(1), 71-75. doi:https://doi.org/10.1207/s15327752jpa4901_13

[16] Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior*.

[17] Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*(1), 35-47. doi:https://doi.org/10.1016/0167-2681(95)00003-B

[18] Elster, J. (1998). Emotions and economic theory. *Journal of economic literature, 36*(1), 47-74. doi:https://www.jstor.org/stable/2564951

[19] Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140. doi:https://doi.org/10.1177/001872675400700202

[20] Frank, R. H. (2005). Are concerns about relative income relevant for public policy? Positional Externalities Cause Large and Preventable Welfare Losses. *The American Economic Review, 95*(2), 137. doi:https://doi.org/10.1257/000282805774670392

[21] Grolleau, G., Ibanez, L., & Mzoughi, N. (2012). Being the best or doing the right thing? An investigation of positional, prosocial and conformist preferences in provision of public goods. *The Journal of Socio-Economics, 41*(5), 705-711.

[22] Grolleau, G., Mzoughi, N., & Saïd, S. (2012). Do you believe that others are more positional than you? Results from an empirical survey on positional concerns in France. *The Journal of Socio-Economics, 41*(1), 48-54. doi:https://doi.org/10.1016/j.socec.2011.10.001

[23] Hillesheim, I., & Mechtel, M. (2012). Relative consumption concerns or non-monotonic preferences? *Available at SSRN 2041113*. doi:https://doi.org/10.2139/ssrn.2041113

[24] Hillesheim, I., & Mechtel, M. (2013). How much do others matter? Explaining positional concerns for different goods and personal characteristics. *Journal of Economic Psychology, 34*, 61-77. doi:https://doi.org/10.1016/j.joep.2012.11.006

[25] Hirsch, F. (1977). Social limits to growth, 1976. *Cambridge MA: Harvard University Press), pgs, 87*, 105. doi:https://doi.org/10.4159/harvard.9780674497900

[26] Johansson-Stenman, O., Daruvala, D., & Carlsson, F. (2001). Are people inequality averse or just risk averse? *rapport nr.: Working Papers in Economics*(43).

[27] Johansson-Stenman, O., Carlsson, F., & Daruvala, D. (2002). Measuring future grandparents' preferences for equality and relative standing. *The economic journal, 112*(479), 362-383. doi:https://doi.org/10.1111/1468-0297.00040

[28] Luttmer, E. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics, 120*(3), 963-1002. doi:https://doi.org/10.1162/003355305774268255

[29] Maslow, A. H. (1943). A theory of human motivation. *Psychological review, 50*(4), 370. doi:https://doi.org/10.1037/h0054346

[30] Rauscher, M. (1997). Conspicuous consumption, economic growth, and taxation. *Journal of Economics, 66*(1), 35-42. doi:https://doi.org/10.1007/BF01231466

[31] Solnick, S. J., & Hemenway, D. (1998). Is more always better?: A survey on positional concerns. *Journal of Economic Behavior & Organization, 37*(3), 373-383. doi:https://doi.org/10.1016/S0167-2681(98)00089-4

[32] Solnick, S. J., & Hemenway, D. (2005). Are positional concerns stronger in some domains than in others? *American Economic Review, 95*(2), 147-151. doi:https://doi.org/10.1257/000282805774669925

[33] Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science, 11*(5), 159-163. doi:https://doi.org/10.1111/1467-8721.00191

[34] Veblen, T. (1899). *The theory of the leisure class*.

[35] Yang, X., Qin, P., & Xu, J. (2016). Positional concern, gender, and household expenditures: a case study in Yunnan province. *China Agricultural Economic Review*.

Appendix A

A.1 Positionality questions

If the participant received subject *self* in the first question, they are deciding for themselves throughout the survey. Equally, if they instead received *grandchild* in the first question, they are deciding for this grandchild in all succeeding positionality questions.

The order of the positionality questions presented in this appendix does not reflect the order received by the participant. In the analysis, we presented the domains in the following order: *SAT score*, *size of house, size of apartment*, *vacation days* and *monthly income*. In the survey, this was random, and only by coincidence did the participant receive the same order as we are using here.

A.1. Positionality domains

A.1.1. SAT-test score

Before entering higher education, it is common to take a SAT test to assess general suitability for education. In which of these states do you think you would feel most satisfied?

Low

A. You/Your grandchild scored **350/1600** in the SAT test this year. In society, people on average score **375/1600**.

B. You/Your grandchild scored **325/1600** in the SAT test this year. In society, people on average score **300/1600**.

C. You/Your grandchild scored **325/1600** in the SAT test this year. In society, people on average score **325/1600**.

D. I do not want to answer.

Medium

A. You/Your grandchild scored **700/1600** in the SAT test this year. In society, people on average score **750/1600**.

B. You/Your grandchild scored **650/1600** in the SAT test this year. In society, people on average score **600/1600**.

C. You/Your grandchild scored **650/1600** in the SAT test this year. In society, people on average score **650/1600**.

D. I do not want to answer.

High

A. You/Your grandchild scored **1400/1600** in the SAT test this year. In society, people on average score **1500/1600**.

B. You/Your grandchild scored **1300/1600** in the SAT test this year. In society, people on average score **1200/1600**.

C. You/Your grandchild scored **1300/1600** in the SAT test this year. In society, people on average score **1300/1600**.

D. I do not want to answer.

A.1.2 Size of house

A stable home is essential to ensure quality of life. Regardless of whether you live alone or with your family, or whether it is on a permanent basis or only temporary. In which of these states do you think you would feel most satisfied?

Low

    A. You/your grandchild and family have a house that is **1,500 square feet** large. In society, the average size of people's houses is **1,650 square feet**.

    B. You/your grandchild and family have a house that is **1,350 square feet** large. In society, the average size of people's houses is **1,200 square feet**.

    C. You/your grandchild and family have a house that is **1,350 square feet** large. In society, the average size of people's houses is **1,350 square feet**.

    D. I do not want to answer.

Medium

    A. You/your grandchild and family have a house that is **4,500 square feet** large. In society, the average size of people's houses is **4,950 square feet**.

    B. You/your grandchild and family have a house that is **4,050 square feet** large. In society, the average size of people's houses is **3,600 square feet**.

    C. You/your grandchild and family have a house that is **4,050 square feet** large. In society, the average size of people's houses is **4,050 square feet**.

    D. I do not want to answer.

High

    A. You/your grandchild and family have a house which is **13,500 square feet** large. In society, the average size of people's houses is **14,850 square feet**.

    B. You/your grandchild and family have a house which is **12,150 square feet** large. In society, the average size of people's houses is **10,800 square feet**.

    C. You/your grandchild and family have a house which is **12,150 square feet** large. In society, the average size of people's houses is **12,150 square feet**.

    D. I do not want to answer.

A.1.3 Size of apartment

Everybody needs a home, whether it is in the city or in areas that are more rural. It might be rented or it may be owned. Regardless of this, it is important to feel at home. In which of these states do you think you would feel most satisfied?

Low

A. You/your grandchild own an apartment that is **500 square feet** large. In society, the average size of people's apartments is **600 square feet**.

B. You/your grandchild own an apartment that is **400 square feet** large. In society, the average size of people's apartments is **300 square feet**.

C. You/your grandchild own an apartment that is **400 square feet** large. In society, the average size of people's apartments is **400 square feet**.

D. I do not want to answer.

Medium

A. You/your grandchild own an apartment that is **1,500 square feet** large. In society, the average size of people's apartments is **1,800 square feet**.

B. You/your grandchild own an apartment that is **1,200 square feet** large. In society, the average size of people's apartments is **900 square feet**.

C. You/your grandchild own an apartment that is **1,200 square feet** large. In society, the average size of people's apartments is **1,200 square feet**.

D. I do not want to answer.

High

A. You/your grandchild own an apartment that is **4,500 square feet** large. In society, the average size of people's apartments is **5,400 square feet**.

B. You/your grandchild own an apartment that is **3,600 square feet** large. In society, the average size of people's apartments is **2,700 square feet**.

C. You/your grandchild own an apartment that is **3,600 square feet** large. In society, the average size of people's apartments is **3,600 square feet**.

D. I do not want to answer.

A.1.4 Paid vacation days

During the year, the employer gives a certain amount of paid vacation days to its employees. In any state of the world, the wages and prices are the same. In which of these states do you think you would feel most satisfied?

Low

    A. You/Your grandchild get **12 days** of paid vacation this year. In society, people have on average **14 days** of paid vacation this year.

    B. You/Your grandchild get **10 days** of paid vacation this year. In society, people have on average **8** days of paid vacation this year.

    C. You/Your grandchild get **10 days** of paid vacation this year. In society, people have on average **10 days** of paid vacation this year.

    D. I do not want to answer.

Medium

    A. You/Your grandchild get **24 days** of paid vacation this year. In society, people have on average **28 days** of paid vacation this year.

    B. You/Your grandchild get **20 days** of paid vacation this year. In society, people have on average **16 days** of paid vacation this year.

    C. You/Your grandchild get **20 days** of paid vacation this year. In society, people have on average **20 days** of paid vacation this year.

    D. I do not want to answer.

High

    A. You/Your grandchild get **48 days** of paid vacation this year. In society, people have on average **56 days** of paid vacation this year.

    B. You/Your grandchild get **40 days** of paid vacation this year. In society, people have on average **32 days** of paid vacation this year.

    C. You/Your grandchild get **40 days** of paid vacation this year. In society, people have on average **40 days** of paid vacation this year.

    D. I do not want to answer.

A.1.5 Monthly income before taxes

Prices and purchasing power are the same in all alternatives. The only difference is the monthly earnings. In which of these states do you think you would feel most satisfied?

Low

    A. You/your grandchild earn **USD 2,000** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes.

    B. You/your grandchild earn **USD 1,700** before taxes every month. In society, people earn on average **USD 1,400** each month before taxes.

    C. You/your grandchild earn **USD 1,700** before taxes every month. In society, people earn on average **USD 1,700** each month before taxes.

    D. I do not want to answer.

Medium

    A. You/your grandchild earn **USD 4,000** before taxes every month. In society, people earn on average **USD 4,600** each month before taxes.

    B. You/your grandchild earn **USD 3,400** before taxes every month. In society, people earn on average **USD 2,800** each month before taxes.

    C. You/your grandchild earn **USD 3,400** before taxes every month. In society, people earn on average **USD 3,400** each month before taxes.

    D. I do not want to answer.

High

    A. You/your grandchild earn **USD 8,000** before taxes every month. In society, people earn on average **USD 9 200** each month before taxes.

    B. You/your grandchild earn **USD 6,800** before taxes every month. In society, people earn on average **USD 5,600** each month before taxes.

    C. You/your grandchild earn **USD 6,800** before taxes every month. In society, people earn on average **USD 6,800** each month before taxes.

    D. I do not want to answer.

A.2 Social demographics

1) What is your gender? (man, woman, other, no answer)

2) What is your birth year? (1944 or earlier, 1945, …, 2003)

3) Do you have children? (year, no, no answer)

4) Do you have grandchildren? (yes, no, no answer)

5) What is your monthly income before tax? (USD 1,000 or less, 1,001–2,000, …, 9,001–10,000, 10,000 or more)

6) Do you hold a university degree? (yes, no, no answer)

7) If you have taken a SAT test, what was your score? (300 or less, 301–400, …, 1,501–1,600, have not taken a SAT test, no answer)

8) Are you currently enrolled at a university? (yes, no, no answer)

9) How many days of paid vacation do you have each year? (5 days or less, 6 to 10 days, …, 21 to 25 days, 26 or more days, no answer)

10) What is the size of your home in square feet? (200 or less, 201–400, 2,601–2,800, 2,801 or larger)

A.3 questions not related to analysis

A.3.1 Life satisfaction

To what extent do you agree with the following statements? (1=strongly disagree, 7=strongly agree)

1) In most ways my life is close to my ideal.
2) The conditions of my life are excellent.
3) I am satisfied with my life.
4) So far I have gotten the important things I want in life.
5) If I could live my life over, I would change nothing.

A.3.2 Positional preferences of others

Prices and purchasing power are the same in all states. In which states of the world does this individual feel most satisfied?

A.3.2.1 Monthly income of others

Low

 A. His/her income is **USD 2,000** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes.

 B. His/her income is **USD 1,700** before taxes every month. In society, people earn on average **USD 1,400** each month before taxes.

 C. His/her income is **USD 1,700** before taxes every month. In society, people earn on average **USD 1,700** each month before taxes.

 D. I do not want to answer.

Medium

 A. His/her income is **USD 4,000** before taxes every month. In society, people earn on average **USD 4,600** each month before taxes.

 B. His/her income is **USD 3,400** before taxes every month. In society, people earn on average **USD 2,800** each month before taxes.

 C. His/her income is **USD 3,400** before taxes every month. In society, people earn on average **USD 3,400** each month before taxes.

 D. I do not want to answer.

High

 A. His/her income is **USD 8,000** before taxes every month. In society, people earn on average **USD 9,200** each month before taxes.

 B. His/her income is **USD 6,800** before taxes every month. In society, people earn on average **USD 5,600** each month before taxes.

 C. His/her income is **USD 6,800** before taxes every month. In society, people earn on average **USD 6,800** each month before taxes.

 D. I do not want to answer.

A.3.2.2 Size of house of others

Prices and purchasing power are the same in all states. In which states of the world does this individual feel most satisfied?

Low

    A. His/her house is **1,500 square feet** large. In society, the average size of people's houses is **1,650 square feet**.

    B. His/her house is **1,350 square feet** large. In society, the average size of people's houses is **1,200 square feet**.

    C. His/her house is **1,350 square feet** large. In society, the average size of people's houses is **1,350 square feet**.

    D. I do not want to answer.

Medium

    A. His/her house is **4,500 square feet** large. In society, the average size of people's houses is **4 950 square feet**.

    B. His/her house is **4,050 square feet** large. In society, the average size of people's houses is **3,600 square feet**.

    C. His/her house is **4,050 square feet** large. In society, the average size of people's houses is **4,050 square feet**.

    D. I do not want to answer.

High

    A. His/her house is **13,500 square feet** large. In society, the average size of people's houses is **14 850 square feet**.

    B. His/her house is **12,150 square feet** large. In society, the average size of people's houses is **10,800 square feet**.

    C. His/her house is **12,150 square feet** large. In society, the average size of people's houses is **12,150 square feet**.

    D. I do not want to answer.

Appendix B

B.1 Descriptive results

Table B1: T-test on differences in background demographics, comparing "no answer" in PP questions to "positional" and "absolute" in the same questions

Domain	Positional (1)	No answer (2)	Absolute (3)	(1)–(2)	(3)–(2)
SAT score					
SAT score	7.0045	4.1905	6.5378	2.8140	2.3473
	N = 673	N = 21	N = 331	(0.023)	(0.059)
Home size	7.7771	6.4286	7.4773	1.3485	1.0487
	N = 673	N = 21	N = 331	(0.105)	(0.211)
Vacation	2.2585	2.3776	2.3810	-0.1191	0.0034
	N = 673	N = 21	N = 331	(0.784)	(0.994)
Income	4.6107	5.3810	4.6254	-0.7703	-0.7556
	N = 673	N = 21	N = 331	(0.294)	(0.285)
House					
SAT score	6.6678	4.9231	6.9383	1.7447	2.0152
	N = 307	N = 13	N = 470	(0.263)	(0.200)
Home size	7.5765	5.7692	7.5213	1.8073	1.7521
	N = 307	N = 13	N = 470	(0.102)	(0.110)
Vacation	2.4463	2.3846	2.2447	0.0617	-0.1399
	N = 307	N = 13	N = 470	(0.915)	(0.806)
Income	4.9479	5.5385	4.6872	-0.5906	-0.8513
	N = 307	N = 13	N = 470	(0.535)	(0.354)
Apartment					
SAT score	7.2156	4.5882	6.6252	2.6274	2.0370
	N = 269	N = 17	N = 587	(0.046)	(0.143)
Home size	7.6208	6.0588	7.7053	1.5620	1.6465
	N = 269	N = 17	N = 587	(0.101)	(0.081)
Vacation	2.4944	2.5882	2.3322	-0.0938	-0.2560
	N = 269	N = 17	N = 587	(0.853)	(0.609)
Income	4.9368	5.2941	4.8109	-0.3573	-0.4832
	N = 269	N = 17	N = 587	(0.666)	(0.550)
Vacation					
SAT score	6.8161	5.2727	6.819	1.5434	1.5463
	N = 299	N = 11	N = 525	(0.347)	(0.368)
Home size	7.6689	5.0794	7.5638	2.5895	2.4844
	N = 299	N = 11	N = 525	(0.020)	(0.027)
Vacation	2.4582	2.3636	2.3448	0.0946	-0.0188
	N = 299	N = 11	N = 525	(0.882)	(0.976)
Income	4.8629	5.8182	4.6724	-0.9553	-1.1458
	N = 299	N = 11	N = 525	(0.358)	(0.251)
Income					

SAT score	7.1390	5.0667	6.2094	2.0723	1.1427
	N = 525	N = 15	N = 406	(0.151)	(0.434)
Home size	7.7124	6.0667	7.3793	1.6457	1.3126
	N = 525	N = 15	N = 406	(0.101)	(0.189)
Vacation	2.4648	2.2667	2.3251	0.1981	0.0584
	N = 525	N = 15	N = 406	(0.711)	(0.912)
Income	4.8210	5.2667	4.6748	-0.4457	-0.5919
	N = 525	N = 15	N = 406	(0.606)	(0.488)

Table B2: Both subjects and low levels

	Absolute	Positional	Egalitarian	Sum
House	42.17%	23.93%	33.90%	100.00%
SAT	20.77%	58.47%	20.77%	100.00%
Apartment	46.30%	21.64%	32.05%	100.00%
Vacation	45.27%	22.51%	32.23%	100.00%
Income	34.78%	39.67%	25.54%	100.00%

Table B3: Both subjects and medium levels

	Absolute	Positional	Egalitarian	Sum
House	42.17%	23.93%	33.90%	100.00%
SAT	20.77%	58.47%	20.77%	100.00%
Apartment	46.30%	21.64%	32.05%	100.00%
Vacation	45.27%	22.51%	32.23%	100.00%
Income	34.78%	39.67%	25.54%	100.00%

Table B4: Both subjects and high levels

	Absolute	Positional	Egalitarian	Sum
House	31.93%	23.75%	44.33%	100.00%
SAT	27.89%	52.63%	19.47%	100.00%
Apartment	39.39%	23.69%	36.91%	100.00%
Vacation	39.39%	24.79%	35.81%	100.00%
Income	31.33%	45.11%	23.56%	100.00%

Table B5: Subject self and all levels

	Absolute	Positional	Egalitarian	Sum
House	41.05%	22.11%	36.84%	100.00%
SAT	25.96%	55.09%	18.95%	100.00%
Apartment	51.93%	19.82%	28.25%	100.00%
Vacation	45.44%	22.63%	31.93%	100.00%
Income	34.74%	39.30%	25.96%	100.00%

Table B6: Subject grandchild and all levels

	Absolute	Positional	Egalitarian	Sum
House	33.52%	27.32%	39.16%	100.00%

SAT	27.50%	53.92%	18.58%	100.00%
Apartment	42.08%	23.68%	34.24%	100.00%
Vacation	38.25%	26.59%	35.15%	100.00%
Income	30.05%	45.90%	24.04%	100.00%

B.2 Linear probability model

Table B7: Correlates of positional preferences for each domain. Average marginal effects. Standard errors in parentheses

	SAT score	House	Apartment	Vacation	Income
Level treatment (low is baseline)					
Medium	-0.065	0.001	-0.009	0.068	0.020
	(0.058)	(0.034)	(0.032)	(0.045)	(0.043)
High	-0.051	-0.001	0.026	0.049	0.054
	(0.082)	(0.035)	(0.036)	(0.045)	(0.049)
Subject treatment					
Grandchild	-0.016	0.056*	0.040	0.039	0.064*
	(0.030)	(0.026)	(0.025)	(0.026)	(0.030)
Gender (male is baseline)					
Female	0.037	0.037	0.007	0.034	0.009
	(0.031)	(0.026)	(0.025)	(0.027)	(0.031)
Socio-demographics					
Higher interval	0.015	-0.040	0.021	-0.004	0.032
	(0.057)	(0.026)	(0.032)	(0.047)	(0.041)
Have children	0.006	-0.070*	-0.035	0.013	-0.001
	(0.036)	(0.031)	(0.031)	(0.032)	(0.036)
Have grandchildren	0.000	0.027	0.046	-0.036	-0.042
	(0.047)	(0.039)	(0.036)	(0.040)	(0.046)
SAT score	0.007*	0.000	0.003	0.000	0.007*
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Size of home	0.007	0.004	0.001	0.002	0.007
	(0.005)	(0.004)	(0.032)	(0.004)	(0.004)
Vacation days	-0.011	0.005	0.005	0.002	0.012
	(0.008)	(0.007)	(0.007)	(0.009)	(0.008)
Income	0.000	0.005	0.004	0.008	0.001
	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)
Age	-0.002*	-0.004***	-0.002*	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1119	1119	1119	1119	1119
R^2	0.0219	0.0303	0.0206	0.0154	0.0238
F(15,1103)	1.72	2.58	1.44	1.10	1.88

*** $p<0.001$, **$p<0.01$, * $p<0.05$

B.3 Subsample analysis

Table B8: Correlates of positional preferences for each domain. Logistic regression with marginal effects. Standard errors in parentheses.

	SAT score	House	Apartment	Vacation	Income
Level treatment (low is baseline)					
Medium	-0.069	0.070	0.024	0.080	0.010
	(0.048)	(0.043)	(0.041)	(0.052)	(0.051)
High	-0.045	0.071	0.089	0.102	0.067
	(0.081)	(0.046)	(0.045)	(0.052)	(0.060)
Subject treatment					
Grandchild	-0.064	0.034	0.051	0.005	0.013
	(0.038)	(0.034)	(0.032)	(0.034)	(0.038)
Gender (male is baseline)					
Female	0.032	0.021	0.017	0.078	0.033
	(0.039)	(0.035)	(0.034)	(0.035)	(0.040)
Socio-demographics					
Higher interval	-0.014	-0.024	0.028	-0.020	0.031
	(0.074)	(0.044)	(0.041)	(0.056)	(0.049)
Have children	0.024	-0.045	-0.014	0.017	-0.033
	(0.045)	(0.040)	(0.039)	(0.040)	(0.046)
Have grandchildren	-0.010	0.034	0.085	-0.015	-0.057
	(0.060)	(0.056)	(0.059)	(0.054)	(0.060)
SAT	0.016	-0.008	-0.012	-0.011*	0.008
	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)
Size of home	0.006	0.002	0.003	0.007	0.012*
	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)
Vacation days	-0.008	0.010	0.014	0.008	0.019
	(0.010)	(0.009)	(0.009)	(0.001)	(0.010)
Income	0.000	-0.004	-0.004	0.002	-0.007
	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)
Age	-0.003	-0.004**	-0.004**	-0.001	-0.003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	667	667	667	667	667
pseudo R^2	0.0221	0.0339	0.0454	0.0260	0.0224
chi2	20.16	25.97	33.89	19.93	20.62

*** $p<0.001$, **$p<0.01$, * $p<0.05$

B.4 Egalitarian and absolute answers

Table B9: Results from unpaired ttest on differences in egalitarian responses sorted on level treatments. P-values in parentheses.

Domain	Low (1)	Medium (2)	High (3)	(1)-(2)	(2)-(3)	(1)-(3)
SAT-score	0.2077	0.1609	0.1947	0.0468	-0.0338	0.013
	N = 76	N = 60	N = 74	(0.101)	(0.225)	(0.661)
House	0.3390	0.3548	0.4433	-0.0158	-0.0885	-0.1043
	N = 119	N = 138	N = 168	(0.654)	(0.012)	(0.004)
Apartment	0.3205	0.2506	0.3691	0.0699	-0.1185	-0.0486
	N = 117	N = 98	N = 134	(0.033)	(<0.001)	(0.168)
Vacation	0.3223	0.3333	0.3510	-0.0110	-0.0177	-0.0287
	N = 126	N = 123	N = 126	(0.745)	(0.617)	(0.406)
Income	0.2554	0.2614	0.2356	-0.0060	0.0258	0.0198
	N = 94	N = 92	N = 94	(0.856)	(0.415)	(0.524)

Table B10: Results from unpaired ttest on differences in absolute responses sorted on level treatments. P-values in parentheses.

Domain	Low (1)	Medium (2)	High (3)	(1)-(2)	(2)-(3)	(1)-(3)
SAT-score	0.2077	0.3137	0.2789	-0.1060	0.0348	-0.0712
	N = 76	N = 117	N = 106	(0.001)	(0.297)	(0.023)
House	0.4217	0.3830	0.3193	0.0387	0.0637	0.1024
	N = 148	N=149	N = 121	(0.285)	(0.064)	(0.004)
Apartment	0.4630	0.5499	0.3939	-0.0869	0.1560	0.0691
	N = 169	N = 215	N = 143	(0.017)	(<0.001)	(0.060)
Vacation	0.4527	0.4038	0.3983	0.0489	0.0055	0.0544
	N = 177	N = 149	N = 143	(0.174)	(0.881)	(0.133)
Income	0.3478	0.3125	0.3133	0.0353	-0.0008	0.0345
	N = 128	N = 110	N = 110	(0.315)	(0.982)	(0.310)

Table B11: Results from unpaired test on differences in egalitarian responses sorted on subject treatments. P-values in parentheses.

Domain	Self (1)	Grandchild (2)	(1)-(2)
SAT-score	0.1895	0.1858	0.0037
	N = 108	N = 102	(0.875)
House	0.3684	0.3916	-0.0232
	N = 210	N = 215	(0.425)
Apartment	0.2825	0.3424	-0.0599
	N = 161	N = 188	(0.030)
Vacation	0.3193	0.3515	-0.0322
	N = 182	N = 193	(0.254)
Income	0.2596	0.2404	0.0192
	N = 148	N = 132	(0.459)

Table B12: Results from unpaired test on differences in absolute responses sorted on subject treatments. P-values in parentheses.

	Self (1)	Grandchild (2)	(1)-(2)
Domain			
SAT-score	0.2596	0.2750	-0.0154
	N = 148	N = 151	(0.561)
House	0.4105	0.3352	0.0753
	N = 234	N = 184	(0.009)
Apartment	0.5193	0.4208	0.0985
	N = 296	N = 231	(0.001)
Vacation	0.4544	0.3825	0.0719
	N = 259	N = 210	(0.015)
Income	0.3474	0.3005	0.0469
	N = 198	N = 165	(0.095)

Table B13: Correlates of egalitarian preferences for each domain. Logistic regression with marginal effects. Standard errors in parentheses.

	SAT-score	House	Apartment	Vacation	Income
Level treatment (low is baseline)					
Medium	-0.040	0.024	-0.066	-0.009	0.009
	(0.029)	(0.037)	(0.035)	(0.035)	(0.033)
High	-0.001	0.097**	0.061	0.044	-0.026
	(0.039)	(0.036)	(0.036)	(0.035)	(0.031)
Subject treatment					
Grandchild	-0.002	0.018	0.061*	0.072	-0.019
	(0.023)	(0.029)	(0.027)	(0.044)	(0.026)
Gender (male is baseline)					
Female	0.012	0.024	0.045	0.024	0.006
	(0.024)	(0.030)	(0.028)	(0.029)	(0.027)
Socio-demographics					
Higher interval	0.010	0.000	0.008	-0.139**	-0.011
	(0.029)	(0.035)	(0.034)	(0.051)	(0.027)
Have children	-0.040	0.043	0.023	-0.041	-0.007
	(0.028)	(0.034)	(0.033)	(0.033)	(0.031)
Have grandchildren	0.080	0.017	-0.050	0.072	0.080*
	(0.036)	(0.044)	(0.041)	(0.044)	(0.040)
SAT (0 if not taken)	-0.007	-0.005	-0.005	-0.004	-0.004
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)
Size of home	-0.006	-0.010*	-0.006	-0.001	-0.004
	(0.004)	(0.044)	(0.004)	(0.004)	(0.004)
Vacation days	0.009	0.007	0.001	0.007	-0.012
	(0.006)	(0.008)	(0.007)	(0.010)	(0.007)
Income	0.000	-0.005	-0.011*	-0.008	-0.005
	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Age	0.002	0.004***	0.002	0.001	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

N	1119	1119	1119	1119	1119
pseudo R^2	0.0265	0.0304	0.0389	0.0193	0.0189
chi2	28.59	45.10	54.06	27.56	23.76

*** $p<0.001$, **$p<0.01$, * $p<0.05$

Table B14: Correlates of absolute preferences for each domain. Logistic regression with marginal effects. Standard errors in parentheses.

	SAT-score	House	Apartment	Vacation	Income
Level treatment (low is baseline)					
Medium	0.011	-0.025	0.074	-0.040	-0.038
	(0.032)	(0.038)	(0.039)	(0.037)	(0.036)
High	0.052	-0.087*	-0.084*	-0.071*	-0.040
	(0.041)	(0.037)	(0.038)	(0.036)	(0.034)
Subject treatment					
Grandchild	0.018	0.011*	-0.101**	-0.078**	-0.040
	(0.027)	(0.029)	(0.029)	(0.029)	(0.043)
Gender (male is baseline)					
Female	-0.048	-0.064	-0.053	-0.059	-0.016
	(0.027)	(0.030)	(0.030)	(0.030)	(0.028)
Socio-demographics					
Higher interval	-0.026	0.035	-0.032	0.127**	-0.015
	(0.036)	(0.036)	(0.037)	(0.040)	(0.030)
Have children	0.034	0.026	0.012	0.028	0.006
	(0.032)	(0.034)	(0.035)	(0.035)	(0.034)
Have grandchildren	-0.076	0.011	0.007	-0.036	-0.039
	(0.040)	(0.045)	(0.046)	(0.045)	(0.043)
SAT (0 if not taken)	0.000	0.005	0.002	0.004	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Size of home	-0.001	0.005	0.006	-0.002	-0.004
	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Vacation days	-0.012	-0.012	-0.005	-0.011	0.000
	(0.007)	(0.008)	(0.008)	(0.010)	(0.008)
Income	0.000	0.001	0.007	0.000	0.004
	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)
Age	0.001	0.000	0.000	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1119	1119	1119	1119	1119
pseudo R^2	0.0179	0.0232	0.0290	0.0189	0.0060
chi2	23.29	34.26	44.82	28.74	8.45

*** $p<0.001$, **$p<0.01$, * $p<0.05$

Paper III

Mageli, I.

Positional concerns and life satisfaction. Does your satisfaction with life increase when you are relatively better off than those around you are?

Manuscript

Positional concerns and life satisfaction – Does your satisfaction with life increase when you are relatively better off than those around you?[1]

Ingvild Mageli[2]

We explored how positional preferences for income, paid vacation days and physical attractiveness influenced satisfaction with life. In this study, we use a five-component measure of life satisfaction combined with a hypothetical decision framework to explore how positional preferences influence how good individuals feel about themselves. These are both established measures in their respective fields, but are not, until now, included in the same study. We measure positional preferences with a representative sample from the US (N=1100). With three questions on each domain, we increase the marginal degree of positionality, making it more expensive to signal status. As social demographic indicators, we cover whether they had children, reported income and vacation days, employment status, university degree, and how attractive they perceived themselves to be. The results suggest that positionality for all domains have, in line with our theory, a negative and significant effect on life satisfaction.

1

1. Introduction

In this paper, we focus on the questions linking relative social standing with individual well-being. Instead of focusing on absolute consumption as the only factor for utility, we now add relative consumption to the equation. When our decisions consciously, or subconsciously incorporate this social comparison, economists define us as "positional" (e.g. Aronsson and Johansson-Stenman, 2014; Carlsson et al., 2008). When we compare ourselves to others, it has an effect on how we feel about ourselves (Wheeler and Miyake, 1992), and we know that social comparison and the size of difference between us and others influences satisfaction with life (e.g. Cheung and Lucas, 2016; Civitci and Civitci, 2015; Frieswijk et al., 2004). The focus in this study is to understand how positional preferences across multiple domains influence individual satisfaction with life. To measure positional preferences we utilize the framework established by Solnick and Hemenway (1998) applied on income, vacation days and physical attractiveness. We then use the five-component Satisfaction with Life Scale (SWLS) framework by Diener et al. (1985) to assess how positional preferences affect general well-being. This is where we aim to fill the gap, by implementing a measure of life satisfaction from psychology, robust to framing effects and other situational factors (Diener et al., 2013).

We care about positional preferences because they may cause unintended external effects and market failures. If one individual engages in conspicuous , this has a utility cost for other individuals. By overproviding work hours, we have an inefficient use of our resources, but we continue doing this because we want to send a signal of our social success (Alpizar et al., 2005; Aronsson and Johansson-Stenman, 2008; Frank, 2005). When we work more, we earn more money, and we believe that our utility will increase. Alpizar et al. (2005) found that when the income increases, 45 percent of the increased utility comes from the direct effect of enjoying a higher relative income. According to research from Oxford University Saïd Business School,[3] there is a conclusive link between productivity and happiness (Bellet et al., 2019).

The concept of positionality dates back to Hirsch (1977), who formalized the definition. Within the social structures of our society, there is a race to be on top. However, there are a limited number of top positions, and there is always a positional race to outperform others

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[3] https://www.ox.ac.uk/news/2019-10-24-happy-workers-are-13-more-productive on February 10th 2021.

competing for the same (Hirsch, 1977). At work, we may have the possibility to decide on how many hours we want to provide. However, we fail to decide the optimal amount, which is why we need a point of reference, and this point of reference is often someone like ourselves. Sometimes, this reference person may be earning more money than us, and with this upward comparison we may get an idea about our future prosperity, increasing our motivation, but it is also possible that this feeling of being below makes us feel worse about ourselves (Suls et al., 2002).

Economists have taught us that almost everybody partakes in social comparison (Duesenberry, 1949; Easterlin, 1995; Frank, 2005), and the human need for social comparison dates back to Veblen (1899) and Festinger (1954). Human beings have an innate need for evaluation of one's own opinion and abilities (Festinger (1957). This is the first hypothesis of Festinger's social comparison theory. One explanation for why people behave this way is because the relative consumption level of a socially valued good signals the relative social standing of the individual. When we evaluate our performance at work, or whether our income is sufficiently high, we are incapable of doing so without a threshold for comparison (Suls et al., 2002). Previous research tells us that people display positional preferences for a wide range of goods, activities and personal characteristics (Alpizar et al., 2005; Bogaerts and Pandelaere, 2013; Carlsson et al., 2008; Carlsson et al., 2007; Celse, 2012; Grolleau et al., 2012; Hillesheim and Mechtel, 2013; Solnick and Hemenway, 1998).

In a relevant study on satisfaction and income, Clark and Oswald (1996) find an inverse relationship between reported satisfaction of workers and their comparison wage rate. With this, and the study by (Senik, 2009), we know that income is important for how individuals feel about themselves. In our study, we include income as well as vacation days and physical attractiveness to explore how positional preferences across multiple domains influence satisfaction with life. It is important to cover a broader aspect than just income because we already have some idea about how this affects our well-being. We already know that individuals tend to display stronger positional concerns for income than they do for leisure time, and personal characteristics such as intelligence and attractiveness are more sensitive to positional concerns compared to public goods, such as crime rates and air quality (Bogaerts and Pandelaere, 2013; Solnick and Hemenway, 1998). By using income, vacation time and physical attractiveness our contribution fits well with the research on behavioral economics. There are arguably several other domains we should include, such as education or housing,

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and we theorize that a higher income signals more education. Statistically, we also know that people with more years of education live longer, and the effect is strongest for the first years of schooling (Meara et al., 2008; Trostel, 2005). However, we chose three different domains, which we predicted to be important factors for well-being. Future scholars may focus on other domains instead, to extend the understanding of how positional preferences influence life satisfaction.

Existing studies have provided important insight on the relationship between positional behavior and general well-being. In the study by del Mar Salinas-Jiménez et al. (2011) the authors find that the effect of educational achievement on life satisfaction decreases when the average level of education increases. Senik (2009) finds that upward comparison has a stronger effect on individual well-being than downward comparison does when comparing own income to that of a reference. Even if we compare income, or educational attainment, our distance from relevant others has an effect on how we feel about ourselves (Luttmer, 2005). If we instead look at the society as a whole, Roth et al. (2017) emphasize that low income inequality leads to happier individuals. All of these studies are important; however, all of these studies referenced above use a single question to measure life satisfaction "*How satisfied are you with your life?*"

This single-item measure of life satisfaction represents a methodological trend, which is common in psychology (Fonberg and Smith, 2019). Although it is often of interest to ask how they feel on the spot, we are more concerned with how they feel about themselves on a general basis since our current well-being is sensitive to immediate external effects (Luhmann et al., 2012). When you experience a major event, the immediate effect on your well-being is either positive (marriage) or negative (disability). However, after time we adapt to our current circumstances and the effect diminishes (Luhmann et al., 2012). There are findings suggesting that the results from either a single-item or from a multiple items toll would yield similar results (Cheung and Lucas, 2014; Fonberg and Smith, 2019). However, according to Simon (1957), humans have limited information when making decisions, and we are both rational and irrational in our behavior. This is why we employ the SWLS framework. This approach covers five items, in contrast to the single-item approach in relevant studies.

When our income increases, we have the opportunity to climb higher up on the Maslow's pyramid of needs (Maslow, 1943) by seeking recreation and self-realization. We have covered

our basic needs as security and shelter and now we can "waste" our money on social activities and luxury commodities. However, when everybody works more, we end up in a never-ending cycle of stress because we strive to be the best. This behavior can have potentially fatal outcomes. In Japan, *karoshi* – death from overwork, – along with *karojisatsu* – stress from mental stress (McAdams, 1992) – are very real and relevant problems and demonstrate a great example of why we should care about positional behavior. However, although we have insight on when and why individuals are positional, an extended focus on how these concerns affect personal well-being is still warranted. Except for a handful of studies focusing on education (del Mar Salinas-Jiménez et al., 2011) and the effect of upwards and downwards comparison (Senik, 2009), we know very little about how positional preferences influence satisfaction with life. This is where we aim to fill the gap.

We have observed data suggesting diminishing returns from income on happiness, and references to the positionality literature on the importance of relative income (Binder and Coad, 2010; Binder and Coad, 2011). Second, in economics literature, we know that positional preferences have external effects for society, but there is little attention to the direct consequences for the individual and their well-being. In contrast to previous studies, (e.g. Akay et al., 2012; Bogaerts and Pandelaere, 2013; Grolleau et al., 2012), we use positional preferences as explanatory factors and look at the consequences they have for the general well-being of the individual.

We have structured this article as follows: Section 2 presents our hypotheses and methods, and Section 3 presents our descriptive results and econometric analysis. Finally, Section 4 concludes. In accordance with good research ethics, and to facilitate replication, we have registered the study with Open Science Framework.[4]

2. Materials and Method
2.1 Hypotheses
We want to test whether and how positional preferences relate to the subjective assessment of life satisfaction with two hypotheses and a research question.

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[4] https://osf.io/tr9v2

H1: *Individuals who are positional score lower on life satisfaction than those who display absolute or egalitarian preferences.*

H2: *The more positional an individual is, the less satisfied with life she/he is.[5]*

Research question 1: *Is there a difference in how different domains affect the satisfaction with life scale?*

In our survey, we have three unique domains – income, vacation days and physical attractiveness. The first hypothesis focuses on the direct effect from positional concerns on life satisfaction and the second hypothesis looks at the effect when the price of positionality increases. Our research question sheds light on the differences between domains and their influence on life satisfaction.

2.2 Participants

We recruited a representative sample of participants via Prolific[6] Academics (N=1100). By completing the survey, the participants were paid an hourly wage of GBP 7.5, deemed as "good" by Prolific Academics. To ensure anonymity, we used the online tool JATOS[7] to distribute the survey. Of these 1100 individuals, 859 (78 percent) provided complete and consistent[8] answers to all questions, including the questions on social demographics. In the final sample, 49 percent identify as male and 51 percent as female. The average participant was born in 1975, earns between USD 4,000 and 4,499 a month before taxes, and has less than 10 days of paid vacation each year. Fifty-four percent of the sample has children, 70 percent holds a university degree and 66 percent holds a job. The average participant rate themselves as 66–70/100 on the attractive scale.

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[5] This is a slight modification of the preregistered hypothesis:
There is a greater effect of positional preferences on life satisfaction when the marginal degree increases.
[6] Prolific is similar to Mturk, but we prefer this tool to the latter because it ensures native representation, ethical rewards and more diverse answers as there are fewer "top responders" than we find in Mturk. (https://prolific.co/).
[7] JATOS (Just Another Tool for Online Studies) is an open-source software, which allows researchers to recruit participants via e.g. Prolific Academics or Amazon Turk, without revealing individual answers to these sites (https://www.jatos.org/).
[8] We omitted observations from individuals switching from A to B between rounds two and three.

2.3 Study design

The survey consisted of the questions on positional preferences and the five statements measuring satisfaction with life, and we randomized the order of these two sections. Half the sample began with the positionality questions, and the second half began with the life satisfaction statements. All participants completed the section on social demographics after both of these. In this section, we give an in-depth presentation of how we measure life satisfaction, which values we use for our domains, and how we identify positional preferences.

2.3.1. Life satisfaction

The satisfaction with life scale contains five different statements, and the participants rate agreement on a scale from 1 (completely disagree) to 7 (completely agree). When the participants give their responses, we pool their answers from each of them, placing them at the lowest possible 5 (extremely dissatisfied) to highest possible 35 (extremely satisfied). The five statements are as follows:

1) In most ways my life is close to my ideal
2) The conditions of my life are excellent
3) I am satisfied with my life
4) So far, I have gotten the important things I want in life
5) If I could live my life over, I would change nothing

Since our sample is a representative selection of US individuals, we can assume that they are as rational and irrational as anyone else in the world. This method has high temporal stability across short intervals of time (Schimmack and Oishi, 2005) and is less sensitive to current events (Diener et al., 2013). We therefore argue that the satisfaction with life scale is preferable to the single-item measurement common in other studies. For the full sample of 859 individuals, the average score is 21.88.

2.3.2 Identification of positional preferences

We measure positional preferences with a hypothetical decision framework established by Solnick and Hemenway (1998), and utilized by a variety of different researchers (e.g. Celse et al., 2017; Grolleau et al., 2012; Solnick and Hemenway, 1998; Solnick and Hemenway, 2005). The following setup illustrates the approach:

- State A: You have 100,000 in yearly wage, others on average have 200,000
- State B: You have 50,000 in yearly wage, others on average have 25,000

When an individual is making a choice between the possible options, they have an underlying utility function $(u_i(x_i, \Delta x))$, which we assume to be either ratio comparison $(u_i = (x_i, x_i/\bar{x}))$ or an additive comparison $(u_i(x_i, x_i - \bar{x}))$ (Carlsson et al., 2007). With the linear additive utility function, the utility for the individual is a factor of consumption and the distance to comparable others:

$$u(x_i, \Delta_i) = (1 - \gamma) \cdot x_i + \gamma(x_i - \overline{x}) \tag{1}$$

The variable x_i is the individual consumption in the positional alternative, and $\bar{x}$ defines the amount of the reference group. This is our assumed utility function. In order to estimate the marginal degree of positionality, we use the following fraction to calculate the gamma value:

$$\gamma = \frac{\dfrac{\partial u_i}{\partial \Delta_i}\dfrac{\partial \Delta_i}{\partial x_i}}{\dfrac{\partial u_i}{\partial x_i} + \dfrac{\partial u_i}{\partial \Delta_i}\dfrac{\partial \Delta_i}{\partial x_i}} \tag{2}$$

With the utility function as presented in (1), the estimation of the gamma value looks like the following:

$$\gamma = \frac{Subject_{absolute\ (A)} - Subject_{positional(B)}}{Reference_{absolute(A)} - Reference_{positional(B)}} \tag{3}$$

If the individual is indifferent between alternatives, the gamma value is the marginal degree of positionality. However, to estimate the actual gamma, we return the example above and substitute in fraction (3). In the numerator, we use the difference in endowment for the subject between the first option and the second option, $100,000 - 50,000$. In the denominator, we use the same value, the difference for the reference between the first and second option, $200,000 - 75,000$. The equation in (3) now looks like this with a gamma value of 0.285:

$$\gamma = \frac{100\,000 - 50\,000}{200\,000 - 25\,000} = \frac{50\,000}{175\,000} = 0.285 \qquad (4)$$

2.3.3 Domains

The first domain we focus on is income, one of the most common domains in research on positionality (e.g. Alpizar et al., 2005; Carlsson et al., 2008; Celse, 2012; Grolleau et al., 2012; Hillesheim and Mechtel, 2013). Although there are multiple studies using this domain, we want to focus on the one by Senik (2009) because this is one of the few that researches welfare effects. The results are clear: Underperforming has a greater effect on individual welfare than overperforming when comparing to a local reference point. To establish the values in this study, we use a value slightly higher than 1/12 of the median annual wage for men in 2020 in the US.[9] This constitutes the reference point in the absolute alternative, and is USD 4,900 before taxes. The individual level is lower than this. We use this approach because we want our values to be realistic and attainable.

Our second domain covers paid vacation days. From the relevant literature research, we observe extensive research on positional preferences for leisure time, although we know that leisure time elicits fewer positional answers than income does (e.g. Celse, 2012; Solnick and Hemenway, 1998). Our theory is that individuals would want to work as little as possible and to maximize their individual leisure time, which is in line with existing research. Similarly, as with income, the domain paid vacation days is also quantifiable and relatable. However, although a few years old, the "No-vacation Nation, Revised" (Maye, 2019) emphasized that the USA is still the only advanced country without rights to paid vacation and that 23% of workers do not receive any paid vacation at all. In addition, the USA is the only country without federal laws entitling its workers to a minimum amount of paid vacation days (Ray et al., 2013). Regardless of the limited access to paid vacation days, we want to relate our study to relevant research, which mandates that vacation, as well as income, is a domain of interest when studying positional preferences. To get a point of reference, we use the annual paid vacation days of Norway (which are the same as in Denmark and Sweden) entitling all workers to 25 days of annual leave each year. Adding one day, this marks the reference for the subject in the absolute highest alternative.

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[9] https://www.thebalancecareers.com/average-salary-information-for-us-workers-2060808 on November 1st 2021.

Our third and final domain is physical attractiveness, and in contrast to the private or public goods, this domain covers personal characteristics. We theorize that subjective attractiveness has a strong connection with self-image and therefore satisfaction with life. We want to believe that beauty comes from inside, but there are certain traits we deem as universal standards for facial attractiveness – average facial proportions (Pallett et al., 2010). An important finding from psychology is the James−Lange theory of emotion. This theory states that our emotional behavior to something is an interpretation of our physical reaction to external stimuli[10](Cherry, 2020) (Cherry, 2020). Challenging this, is the theory stating that our physiological reactions are instead a consequence of our emotions (Cannon, 1927). Regardless of whether our physical or emotion reaction comes first, an existing theory is that happy people smile more, and we therefore perceive them as more attractive (Diener et al., 1995). Although existing research emphasizes a connection between life satisfaction and physical attractiveness, an understanding of how positional preferences play a part is still missing. To find suitable values we focus on what we have from existing research and multiply them, placing them on the scale from 1−100 (e.g. Bogaerts and Pandelaere, 2013; Grolleau et al., 2012).

2.3.4 Positional preferences

In our study, we use three different domains, and we include three questions for each domain, slightly increasing the marginal degree of positionality between alternatives. For each of the three questions, the framing is the same, and the subject can choose between four different options – an absolute, positional and egalitarian option. We also include a fourth option if the individual is indifferent to each of the alternatives.

In order to tease out positional preferences, we used hypothetical decision-making (e.g. Solnick and Hemenway, 1998), tasking the subject with choosing their desired state of the world. We present the subjects with at least two states of the world. In the first alternative they have more than in the second option, but they have less than everybody else. In the second alternative, the subjects have less than in the first alternative, but they have more than the average of others. Hence, the first option presents the absolute highest, but relatively the lowest. The second option presents the absolute lowest, but relatively the highest. By definition, the individual is positional if they chose the second alternative. Various researchers

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[10] https://www.verywellmind.com/what-is-the-james-lange-theory-of-emotion-2795305 on March 17th 2021.

have augmented this approach by adding a third option capturing egalitarian preferences (Celse, 2012) or an option to capture indifference (Hillesheim and Mechtel, 2013) because some individuals may suffer from decision- or inequality-aversion.

If the subject cares only about their absolute consumption, they choose the absolute option (A). This gives them more than in any other of the other alternatives but less than the reference group. The next alternative is the positional (B), in which the subject has less than in the first alternative but more than the reference group. This is optimal if they care only about their relative standing. Our third alternative is the egalitarian choice (C). If the individual chooses this, they have the same amount as in alternative B (positional) and the same as the reference in society. In a similar piece of research, Celse (2012) argues that this alternative is optimal if the individual expresses inequality aversion. By including the fourth alternative, we force the participants to take an active choice, even if they do not prefer one state to the other.

Below, we present an example of our positionality question with the lowest gamma value:

Each year you get a certain amount of paid leave. The prices are identical in all states; only your amount of paid vacation varies. In which states of the world do you think that you would feel most satisfied?

    A. Every year, you get **26** days of paid vacation. In society, the average worker gets **30** days of paid vacation.

    B. Every year, you get **22** days of paid vacation. In society, the average worker gets **14** days of paid vacation.

    C. Every year, you get **22** days of paid vacation. In society, the average worker gets **22** days of paid vacation.

    D. All the options are equally good.

In alternative A, the individual has 26 days of vacation, and in alternative B the individual has 22 days. The difference is 4 days, and we use this as the numerator in expression (3). The reference group has 30 days of vacation in alternative A, and 14 days of vacation in alternative B, with a difference of 16, the denominator in our expression. Since 4 is one quarter of 16, the gamma value becomes 0.25. We calculated the second and third gamma with the same method.

$$\gamma = \frac{26 - 22}{30 - 14} = 0.25 \qquad (5)$$

For each domain, we had three different questions of identical phrasing, varying the gamma value for each round from 0.25, to 0.375 and finally 0.50. To avoid ordering effects, we randomized the order of the domains, although we kept the sequence of increasing marginal positionality constant for all participants. Below we list how the endowment in the positional alternative varies with each question.

Table 1: Distribution of endowment across domains and gamma values

	Self	Reference	Degree
Income			
Society A	4,900	5,500	
Society B,1	4,100	2,300	$\gamma=0.250$
Society B,2	3,700	2,300	$\gamma=0.375$
Society B,3	3,300	2,300	$\gamma=0.500$
Paid vacation days			
Society A	26	30	
Society B,1	22	14	$\gamma=0.250$
Society B,2	20	14	$\gamma=0.375$
Society B,3	18	14	$\gamma=0.500$
Physical attractiveness			
Society A	80	93	
Society B,1	68	45	$\gamma=0.250$
Society B,2	62	45	$\gamma=0.375$
Society B,3	56	45	$\gamma=0.500$

3. Results and Analysis

3.1 Results from pretest analysis

Prior to launching this study, we included the five-component model of life satisfaction in an earlier survey without any connection to the rest of the questions and statements. In this survey, we had 1,119 valid observations, and all participants responded to the statements on life satisfaction. The framing, sequence and options were the same both in the current and in the previous test, and the average score in the pretest was 22.15, compared to 22.00 in this study. This suggests that responses on life satisfaction is insensitive to surrounding factors, and that the individuals are relatively consistent when evaluating their perceived satisfaction with life.

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In this pretest study, we measured positional preferences in five different domains as well, but the marginal degree of positionality was 0.33 in all five questions. As dependent variable, we used confirmatory factor analysis on the five-item satisfaction measure. In *Table 2* we present the descriptive statistics for this variable from the pretest analysis. These results suggest that the data are suitable for factor analysis. With a Kaiser–Meyer–Olkin (KMO) score above 0.89, the sampling adequacy is marvelous.[11]

Table 2: Descriptive statistics for factor scores from confirmatory factor analysis

	Obs	Mean	Std. Dev.	Min	Max	KMO	Cronbach's alpha
Satisfaction with life	1119	0.000	0.9369	-2.155	1.486	0.8936	0.9324

We constructed five different positionality dummies as explanatory factors and ran both a robust linear regression and a generalized linear squared regression. We report the regressions results in *Table A1* in the appendix. In this regression, we included all five positionality dummies as explanatory factors, as well as a set of socio-demographic indicators. From the results, we see that neither of the positionality dummies are significant. An explanation for this might be that we included all five dummies in the regression, as opposed to the main study where we ran one regression for each positionality domain. In addition, individual reported income, vacation days and size of home are all positive and significant in predicting life satisfaction. Having children, a higher education degree or being a student all have a negative and significant effect.

3.2 Descriptive statistics

3.2.1 Responses on positionality questions

We list the distribution of positional answers sorted on domains and gamma value in *Table 3* below. As can be seen in the table, the share of positional answers is negatively correlated with the gamma level in all domains. This is expected, as the individual has to give up more consumption to have relatively more than others at higher levels of gamma. Both the share of

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[11] 0.00 to 0.49 unacceptable, 0.50 to 0.59 miserable, 0.60 to 0.69 mediocre, 0.70 to 0.79 middling, 0.80 to 0.89 meritorious, 0.90 to 1.00 marvelous https://www.statisticshowto.com/kaiser-meyer-olkin/ on December 3rd.

egalitarian and equally good responses falls with an increasing marginal degree of positionality. In all domains, we endowed the participants with the same amount in both the positional and the egalitarian option.

Table 3: Distribution of answers sorted on gamma value and domain

	Absolute	Positional	Egalitarian	Equally good	Sum
Vacation					
gamma = 0.25	47.61%	16.30%	25.73%	10.36%	100.00%
gamma = 0.375	52.27%	15.60%	23.40%	8.73%	100.00%
gamma = 0.50	62.86%	12.81%	16.53%	7.80%	100.00%
Income					
gamma = 0.25	26.08%	39.23%	25.61%	9.08%	100.00%
gamma = 0.375	35.74%	35.62%	20.26%	8.38%	100.00%
gamma = 0.50	40.86%	32.71%	18.86%	7.57%	100.00%
Attractiveness					
gamma = 0.25	25.96%	33.99%	26.66%	13.39%	100.00%
gamma = 0.375	31.78%	32.95%	23.86%	11.41%	100.00%
gamma = 0.50	40.16%	30.62%	18.16%	11.06%	100.00%

Some participants switched from the absolute answer to the positional answer when the gamma value increased. Since these inconsistent responses may signal mindless participation, we chose to eliminate them from the final analysis. In the final sample, there are no observations for which the individual chose the positional option after choosing the absolute option for a lower gamma value.

3.2.2 Bivariate tests on SWLS score

We wanted to know how positional preferences affect life satisfaction, and how the different gamma variation influences the score. In *Table 3,* we saw that there the share of positional answers decreased with increasing gamma values, for all three domains. To check whether this decrease is significant, we ran a set of bivariate tests comparing the shares of positional answers for each of the gamma values.

In this paper, our first hypothesis is that positional preferences reduce satisfaction with life. Our second hypothesis states that the effect on life satisfaction is stronger for more positional individuals. As a first test of these hypotheses, we ran a set of bivariate tests. In these tests, we

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compared the SWLS score for positional individuals to that of individuals with standard (i.e. absolute) and egalitarian preferences, respectively. We present the results in *Table 4* below.

In the first three columns, we list the share of preferences and the number of individuals in these groups. In the fourth and fifth columns, we present the difference between absolute and positional, and egalitarian and positional and the related p-value. As can be seen in *Table 4*, our bivariate test results suggest that individuals who are positional about their attractiveness are less satisfied with life than individuals who only care about attractiveness in absolute terms, or have egalitarian preferences. However, we see no indication that the degree of positionality matters. In addition, we find no significant differences in SWLS between positional individuals and non-positional individuals for income and vacation.

Table 4: Two-sided t-test on life satisfaction score. The first row for each gamma value represents the SWLS score. P-values in parentheses.

Domain	Absolute (1)	Positional (2)	Egalitarian (3)	(1)–(2)	(3)–(2)
Vacation					
Gamma 1	22.019	20.821	22.004	1.198	1.183
	N = 409	N = 140	N = 221	(0.106)	(0.120)
Gamma 2	21.768	20.933	22.413	0.835	1.48
	N = 449	N = 134	N = 201	(0.254)	(0.057)
Gamma 3	21.909	21.064	21.585	0.845	0.521
	N = 540	N = 110	N = 142	(0.276)	(0.565)
Income					
Gamma 1	22.442	21.27	22.032	1.172	0.762
	N = 224	N = 337	N = 220	(0.068)	(0.224)
Gamma 2	22.046	21.719	21.494	0.327	-0.225
	N = 307	N = 306	N = 174	(0.578)	(0.743)
Gamma 3	21.823	21.847	21.839	-0.024	-0.008
	N = 351	N = 281	N = 162	(0.968)	(0.992)
Attractiveness					
Gamma 1	22.807	20.551	21.886	2.256	1.134
	N = 223	N = 292	N = 229	(<0.001)	(0.042)
Gamma 2	22.476	20.276	22.439	2.200	2.163
	N = 273	N = 283	N = 205	(<0.001)	(0.002)
Gamma 3	21.843	20.738	22.821	1.105	2.083

| | N = 345 | N = 263 | N = 156 | (0.066) | (0.00) |

* p<0.05 ** p<0.01 *** p<0.001

One potential reason for the lack of significant differences for income and vacation in *Table 4* is maybe because the table includes switches between the options at higher gamma values. This means that the sample in column 1, gamma values 0.375 or 0.500 (absolute) consists of individuals switching from positional, egalitarian or equally good to the absolute option after the first choice. Column 2 captures individual switching from egalitarian or equally good option at the first or second gamma value. We omitted individuals switching to the positional option after preferring the absolute alternative for a previous gamma value. If positional preferences affect SWLS, then this means that the SWLS scores for gamma>0.25 in column 1 are biased downwards. To check for this possibility, we reran the same binary test using only responses for those answering the same option for all different gamma values. We present the results in *Table 5*. The row for the first gamma value is identical as that in *Table 4*, but the rest of the table disregards the switches. Similarly, with the previous table, only the differences for attractiveness are significant.

Table 5: Two-sided t-test on the life satisfaction score between groups preferring the same state for all gamma values. The first row for each gamma value represents the SWLS score. P-values in parentheses

	Absolute (1)	Positional (2)	Egalitarian (3)	(1)–(2)	(3)–(2)
Domain					
Vacation					
Gamma 1	22.029	20.821	22.004	1.198	1.183
	N = 409	N = 140	N = 221	(0.106)	(0.120)
Gamma 2	22.01	20.864	22.345	1.146	1.481
	N = 390	N = 118	N = 177	(0.147)	(0.074)
Gamma 3	22.085	20.659	21.555	1.426	0.896
	N = 386	N = 88	N = 119	(0.108)	(0.367)
Income					
Gamma 1	22.442	21.27	22.032	1.172	0.762
	N = 224	N = 337	N = 220	(0.069)	(0.224)
Gamma 2	22.483	21.681	21.98	0.802	0.299
	N = 207	N = 282	N = 147	(0.234)	(0.685)

Gamma 3	22.359	21.752	22.047	0.607	0.685
	N = 204	N = 254	N = 128	(0.252)	(0.704)
Attractiveness					
Gamma 1	22.807	20.551	21.886	2.256	1.335
	N = 223	N = 292	N = 229	(<0.001)	(0.042)
Gamma 2	22.855	20.316	22.333	2.539	2.017
	N = 214	N = 253	N = 177	(<0.001)	(0.005)
Gamma 3	22.794	20.826	22.648	1.968	1.822
	N = 209	N = 207	N = 122	(0.005)	(0.029)

3.3 Econometric analysis

3.3.1 Regression design

In order to find out whether our initial theories are correct, we use an econometric model of the following form:

$$SWLS = \alpha_i + \beta_1 PP_{domain_{i}|[0,3]} + \beta_2 EG_{domain_{i}|[0,3]}$$
$$+ \gamma_i' \sum social\ demographics + \varepsilon \tag{6}$$

In equation (6), the dependent variable is a factor score from each of the five statements related to SWLS. We created this measurement instrument by employing confirmatory factor analysis on the five different satisfaction statements. Our analysis shows that the instrument had a Cronbach's alpha above 0.9 (*Table 6*). In addition, we had a KMO test value of 0.8902, suggesting that the data are very suitable for factor analysis. See *Table 6* below for the reported statistics.

Table 6: Descriptive statistics for factor scores from confirmatory factor analysis

	Obs	Mean	Std. Dev.	Min	Max	KMO	Cronbach's alpha
Satisfaction with life	859	0.000	0.9654	-2.251	1.605	0.8902	0.9211

With a generalized least square regression framework, we predicted this factor score for three individual regressions, including social demographic indicators and either the categorical positionality variable, or the categorical egalitarian variable. The variable $PP_{domain_{i}|[0,3]}$

represents the ordered categorical variable for positional answers in a domain. Each of these variables have four categories:

- 0 (reference level) – the individual did not choose the positional alternative for the first gamma value
- 1 = the individual chose the positional alternative for gamma = 0.25 but not for higher level
- 2 = the individual chose the positional value for gamma = 0.375 (and for gamma = 0.25) but not for higher gamma values
- 3 = the individual chose the positional alternative for all gamma levels.

The second variable $EG_{domain_i|[0,3]}$ follows a similar structure, only for the egalitarian responses:

- 0 (reference level) – the individual did not choose the egalitarian alternative for the first gamma value
- 1 = the individual chose the egalitarian alternative for gamma = 0.25 but not for higher level
- 2 = the individual chose the egalitarian value for gamma = 0.375 (and for gamma = 0.25) but not for higher gamma values
- 3 = the individual chose the egalitarian alternative for all gamma levels.

In addition to these variables, we control for the order (life satisfaction first or positionality questions first), a set of demographic indicators in the regressions such as gender, age, employment and educational attainment, and the reported values on attractiveness, income and vacation days.

3.3.2 Econometric results

To test our hypotheses we ran six different regressions, two for each of the three positionality domains. As our dependent variable, we used the factor score combined for each of the five components in the life satisfaction scale. We used both of the two ordered variables controlling for degree of positionality or egalitarian preferences. The first variable controls for positionality versus those who prefer the absolute or the equally good alternatives. The same holds true for the egalitarian variable. As explanatory variables we use reported income, days of paid vacation and perceived attractiveness, in addition to dummies on whether they have

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children, hold a university degree and if they are currently employed. We also control for gender and age. We report on the regression results in *Table 7* below.

Table 7: Correlates of generalized least square with SWLS (factor) as dependent variable. Standard errors in parentheses

	SWLS (vacation)	SWLS (income)	SWLS (attractive)
Positionality			
Gamma = 0.25	-0.295	-0.372**	-0.255
	(0.255)	(0.128)	(0.151)
Gamma = 0.375	0.0570	-0.211	-0.502***
	(0.147)	(0.174)	(0.143)
Gamma = 0.50	-0.189*	-0.166*	-0.246***
	(0.096)	(0.072)	(0.0747)
Egalitarian			
Gamma = 0.25	-0.122	-0.083	-0.418***
	(0.108)	(0.098)	(0.118)
Gamma = 0.375	0.234*	-0.118	-0.201
	(0.109)	(0.224)	(0.108)
Gamma = 0.50	-0.122	-0.082	0.0108
	(0.082)	(0.092)	(0.086)
Socio-demographics			
Female	0.088	0.091	0.080
	(0.060)	(0.060)	(0.060)
Children	-0.280***	-0.278***	-0.274***
	(0.070)	(0.070)	(0.068)
Employed	-0.005	-0.005	0.000
	(0.078)	(0.078)	(0.078)
Higher education degree	-0.158*	-0.158*	-0.149*
	(0.070)	(0.069)	(0.069)
Income	0.027***	0.027***	0.0262***
	(0.005)	(0.005)	(0.005)
Vacation days	0.0120**	0.012***	0.0124***
	(0.004)	(0.004)	(0.004)
Attractiveness	0.0705***	0.070***	0.0700***
	(0.010)	(0.010)	(0.009)
Age	0.0051*	0.005*	0.0049*
	(0.002)	(0.002)	(0.002)
Ordering effects	-0.072	-0.074	-0.088
	(0.058)	(0.058)	(0.058)

Constant		-0.751**	-0.757**	-0.720**		
		(0.269)	(0.269)	(0.266)		
N		859	859	859		
AIC		2.5113	2.5135	2.4929		
BIC		-5098.089	-5096.754	-5066.825		

p-values in parentheses

* p<0.05   ** p<0.01   *** p<0.001

SWLS is abbreviated from "Satisfaction With Life Scale"

The first three columns present the results with the categorical positionality variable as regressors. This suggests that the effect from positional preferences is strongest for domain attractiveness, with both the second (0.375) and the third (0.50) gamma value significant at 0.001 significant level. With a negative coefficient, this is as expected. For the domain income, the first (0.25) and third (0.50) gamma value is negative and significant, which is also in line with our theory. We find no significant effects from positional preferences for vacation. In sum, we conclude that individuals with a relatively low level of positionality are less satisfied with their lives than people who display absolute or egalitarian preferences. These results confirm our first hypothesis (**H1)** predicting that those who display positional preferences are less satisfied with their lives.

Our findings also answer our research question (**R1)**, as the effects from vacation, income and physical attractiveness vary in intensity and significance. However, to test whether these differences are significant, we ran a set of bivariate tests. *Table 8* presents the difference in shares and the p-value from paired t-test. We report only on p-values larger than 0.001. For vacation, the decline is significant between the second and third gamma, but also between the first and third gamma. The next domain is income, and we see that the decline in positional answers is significant between the first and the second gamma, as well as between the second and third. It is also significant from the first to the third. Finally, the decline is significant for attractiveness, between the second and third gamma, and from the first to the third as well. We now know that different domains influence life satisfaction, but also that the decline in the share of positional answers provides significance.

Table 8: Two-sided t-test on the effect of marginal degree of positionality. P-values in parentheses

	Gamma 1	Gamma 2	Gamma 3	G1–G2	G1–G3	G2–G3
Domain						

Vacation	0.163	0.156	0.128	0.007	0.028	0.035
	N=140	N=134	N=110	(0.3307)	(<0.001)	(<0.001)
Income	0.392	0.356	0.327	0.036	0.029	0.065
	N=337	N=306	N=281	(<0.001)	(<0.001)	(<0.001)
Attractiveness	0.341	0.33	0.307	0.011	0.023	0.034
	N=297	N=288	N=268	(0.2789)	(0.0106)	(0.0391)

Regarding our second hypothesis **(H2),** we cannot confirm it. Our regression setup allows us to interpret the coefficients in *Table 8* as the effect on the factor score for life satisfaction, from choosing the positional alternative. For our hypothesis to hold true, the coefficient in absolute value has to increase, or change from insignificant to significant between two increasing gamma values. This holds true only for vacation and income at gamma = 0.50, and physical attractiveness at gamma value 0.375.

From the social demographic indicators, we observe that having children gives a negative and significant effect on life satisfaction. The same holds true for having higher education, although income has a positive and significant effect on satisfaction with life. Looking at reported vacation days and perceived attractiveness, these are both positive and significant, and older individuals are slightly more satisfied with life than younger peers are. With the indicator setup, there are no differences between genders, but the dummy on female is significant when not separating the positionality variables based on marginal degree.

These results support the theory that positional preferences have an effect on how good we feel about ourselves, and that there are some differences between the effect from different domains. However, we also find some insignificant effects from the lowest (vacation and attractiveness) and medium (income and attractiveness) gamma values. This may suggest that these findings warrant further research as the degree of positionality should be even lower than 0.25. Although we do not label them as positional, they might still exhibit these preferences if measured at lower values, such as 0.1 or 0.25.

In our econometric analysis, we used generalized least square regression the test our hypotheses. Since we wanted to check if the results were consistent with a less complex model, we reran the same regressions using an ordinary least square framework. The

dependent variable and the included regressors are the same, and the results in *Table A2* in the appendix suggests that our results are relatively robust with only slight variations in the coefficients and p-values.

3.3.3 Relationship between reported values and positional preferences

In our study, we included questions on reported vacation, income and attractiveness. Although a little bit outside the scope of our hypotheses, we can check how these relate to the choices in the same positionality domains. In *Table 9* below, we list how the reported values vary with the choices in the same domain, and we use two-sample t-tests to check whether this difference is significant.

Table 9: Two-sided t-test on the reported values of vacation, income and attractiveness for each choice in the positionality domains. P-values in parentheses

	Absolute (1)	Positional (2)	Egalitarian (3)	(1)–(2)	(3)–(2)
Domain					
Vacation	**Reported vacation**				
Gamma 1	10.402	11.586	8.778	-1.184	-2.808
	N = 409	N = 140	N = 221	(0.122)	(0.012)
Gamma 2	9.494	11.358	8.786	-1.864	-2.572
	N = 449	N = 134	N = 201	(0.165)	(0.025)
Gamma 3	9.680	12.336	8.535	-2.656	-3.801
	N = 540	N = 110	N = 142	(0.015)	(0.004)
Income	**Reported income**				
Gamma 1	8.683	10.281	8.559	-1.598	-1.722
	N = 224	N = 337	N = 220	(0.005)	(0.004)
Gamma 2	8.544	10.500	8.390	-1.956	-2.110
	N = 307	N = 306	N = 174	(<0.001)	(0.001)
Gamma 3	8.550	10.591	8.574	-2.041	-2.017
	N = 351	N = 281	N = 162	(<0.001)	(0.003)
Attractiveness	**Reported attractiveness**				
Gamma 1	14.341	13.408	13.188	0.933	-0.220
	N = 223	N = 292	N = 229	(0.002)	(0.445)
Gamma 2	14.337	13.350	13.180	0.987	-0.170
	N = 273	N = 283	N = 205	(<0.001)	(0.572)
Gamma 3	14.014	13.361	13.256	0.653	-0.105

| | N = 345 | N = 263 | N = 156 | (0.017) | (0.74) |

* p<0.05 ** p<0.01 *** p<0.001

These results suggest that individuals who display positional preferences for income and vacation report significantly higher values than those who prefer the absolute or egalitarian alternative. We theorize that these people are incentivized to signal status and abundance, and they derive utility from this behavior. In the real world, they have more money and spare time than average and their well-being is conditional on this.

4. Discussion and Concluding Remarks

The economic man – homo economicus – is a perfectly rational individual who maximizes only their own individual utility in every possible occasion. From traditional economic theory, the purpose is to maximize individual utility as a function of absolute consumption, and in this simplified world, the economic man is the perfect inhabitant. However, human beings are not homo economicus and in many situations we are concerned with both absolute and relative consumption (Alpizar et al., 2005).

In this study, we focused on how positional preferences influence satisfaction with life. We used a hypothetical decision framework to tease out positional preferences in three different domains – income, vacation days and physical attractiveness. In addition, we used the Satisfaction with Life scale (Diener et al., 1985), where we asked the participant to evaluate five unique statements about their current life situation, potential regrets and aspirations. When you have to evaluate your life looking backwards and thinking about the future, we are certain the answers you give are less sensitive to how you feel on a specific day since we adapt to external shocks and life-altering situations (Diener et al., 2013; Luhmann et al., 2012).

We recruited a representative sample of 1,100 US individuals through Prolific Academics, and received 872 complete answers, eliminating "no answer" and inconsistent responses. The survey consisted of two sections – the questions on life satisfaction and the questions on positional preference. Half the sample completed the questions on life satisfaction before the positionality questions, and the second half after. We randomized the order of the positionality domains. Only by coincidence did they read the domains in the same order as

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presented in this article. In each domain, we kept the sequence of the three questions constant with an increasing marginal degree of positionality for each question.

The results suggest that individuals who choose the positional option score lower on the aggregated life satisfaction score, compared to those who chose the absolute or equally good option. This is in line with our main prediction. We find the strongest effect for physical attractiveness, with a negative and significant effect, although the results also suggest that positional preferences for income have a negative influence on satisfaction with life. However, own reported income has a positive and significant effect.

From the econometric analysis, we also observe that having children and having a university degree has a negative and significant influence on satisfaction with life, and in line with common perception, a higher income has a positive and significant effect on life satisfaction. Individuals who perceive themselves as more attractive and those with more vacation days are generally more satisfied with life. Finally, we find no effect from employment status, gender or age. However, these results suggest that there are no significant effects when we control for positional preferences as well as the social demographic indicators. In similar studies where the social demographic variables are the same, and the dependent variables focus on satisfaction, other scholars may find them to be significant because they vary what variables they have and what they choose to include. Regardless of these, our findings are internally valid and have important implications for the research field on the relationship between positional preferences and satisfaction with life.

If researchers wish to further explore the relationship between life satisfaction and positional preferences they may want to use a different sample. In our study, we used a representative sample of US individuals, an industrialized country with good life expectancy and access to education. However, in the third world, access to decent healthcare or schooling is a luxury available to a few fortunate families. It would be interesting to distribute a similar survey using two representative samples from the same country, one consisting of people in poverty, and the other of people living in luxury in the same country, to explore how this influences the decisions. With this method, we can explore whether the effects from positionality on life satisfaction are the same regardless of samples, as the demand (and access) to luxury is rarer on low-income countries. Hence, it may be more difficult to predict how individuals perceive them.

Additionally, the participants in this survey received the same compensation, and therefore had no incentive to choose one alternative over the other. If someone decided to extend this approach to real-life experiments with real stakes, it could be possible to tease out the real preferences by giving the participants something to lose. Instead of reading theoretical values of what you could have, you would have to choose between situations where you actually have to give up money in order to have more than the reference person has. This setup resembles the Dictator game, with one player making the decisions. In a situation where you want to test this empirically, it is difficult to use other domains than income since researchers do not so easily influence physical attractiveness or paid vacation days. Even so, we encourage future researchers within the same field to take this a step further by augmenting our setup in an effort to increase the knowledge about positional preferences and their implications for individual well-being.

There are several limitations to our study and framework, and in some ways, we raise more questions than we give answers to. Even so, this is, to the best of our knowledge, the first study using positional preferences in multiple domains to predict life satisfaction. We show that there are differences in how people feel about their life based on how they choose in a hypothetical setting. Our goal is that this study will be a stepping-stone into further bridging the relationship between positional preferences from economics and satisfaction with life from psychology.

The author declares that she has no conflict of interest.

References

[1] Akay, A., Martinsson, P., & Medhin, H. (2012). Does positional concern matter in poor societies? Evidence from a survey experiment in rural Ethiopia. *World Development, 40*(2), 428-435. doi:https://doi.org/10.1016/j.socec.2018.12.005

[2] Alpizar, F., Carlsson, F., & Johansson-Stenman, O. (2005). How much do we care about absolute versus relative income and consumption? *Journal of Economic Behavior & Organization, 56*(3), 405-421. doi:https://doi.org/10.1016/j.jebo.2002.10.007

[3] Aronsson, T., & Johansson-Stenman, O. (2008). When the Joneses' consumption hurts: Optimal public good provision and nonlinear income taxation. *Journal of public economics, 92*(5-6), 986-997. doi:https://doi.org/10.1016/j.jpubeco.2007.12.007

[4] Aronsson, T., & Johansson-Stenman, O. (2014). Positional preferences in time and space: Optimal income taxation with dynamic social comparisons. *Journal of Economic Behavior & Organization, 101*, 1-23. doi:https://doi.org/10.1016/j.jebo.2014.01.004

[5] Bellet, C., De Neve, J. E., & Ward, G. (2019). Does employee happiness have an impact on productivity? *Saïd Business School WP, 13.*

[6] Binder, M., & Coad, A. (2010). *Going beyond average Joe's Happiness: Using quantile regressions to analyze the full subjective well-being distribution*. Papers on Economics and Evolution.

[7] Binder, M., & Coad, A. (2011). From Average Joe's happiness to Miserable Jane and Cheerful John: using quantile regressions to analyze the full subjective well-being distribution. *Journal of Economic Behavior & Organization, 79*(3), 275-290. doi:https://doi.org/10.1016/j.jebo.2011.02.005

[8] Bogaerts, T., & Pandelaere, M. (2013). Less is more: Why some domains are more positional than others. *Journal of Economic Psychology, 39*, 225-236. doi:https://doi.org/10.1016/j.joep.2013.08.005

[9] Cannon, W. B. (1927). The James-Lange theory of emotions: A critical examination and an alternative theory. *The American journal of psychology, 39*(1/4), 106-124. doi:https://doi.org/10.2307/1415404

[10] Carlsson, F., Gupta, G., & Johansson-Stenman, O. (2008). Keeping up with the Vaishyas? Caste and relative standing in India. *Oxford Economic Papers, 61*(1), 52-73. doi:https://doi.org/10.1093/oep/gpn015

[11] Carlsson, F., Johansson-Stenman, O., & Martinsson, P. (2007). Do you enjoy having more than others? Survey evidence of positional goods. *Economica, 74*(296), 586-598. doi:https://doi.org/10.1111/j.1468-0335.2006.00571.x

[12] Celse, J. (2012). Is the positional bias an artefact? Distinguishing positional concerns from egalitarian concerns. *The Journal of Socio-Economics, 41*(3), 277-283. doi:https://doi.org/10.1016/j.socec.2012.01.002

[13] Celse, J., Galia, F., & Max, S. (2017). Are (negative) emotions to blame for being positional? An experimental investigation of the impact of emotional states on status preferences. *Journal of Behavioral and Experimental Economics, 67*, 122-130.

[14] Cherry, K. (2020). The James-Lange Theory of Emotion. Retrieved from https://www.verywellmind.com/what-is-the-james-lange-theory-of-emotion-2795305

[15] Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life research, 23*(10), 2809-2818. doi:https://doi.org/10.1007/s11136-014-0726-4

[16] Cheung, F., & Lucas, R. E. (2016). Income inequality is associated with stronger social comparison effects: The effect of relative income on life satisfaction. *Journal of personality and social psychology, 110*(2), 332. doi:https://doi.org/10.1037/pspp0000059

[17] Civitci, N., & Civitci, A. (2015). Social comparison orientation, hardiness and life satisfaction in undergraduate students. *Procedia-Social and Behavioral Sciences, 205*, 516-523. doi:https://doi.org/10.1016/j.sbspro.2015.09.062

[18] Clark, A. E., & Oswald, A. J. (1996). Satisfaction and comparison income. *Journal of public economics, 61*(3), 359-381. doi:https://doi.org/10.1016/0047-2727(95)01564-7

[19] del Mar Salinas-Jiménez, M., Artés, J., & Salinas-Jiménez, J. (2011). Education as a positional good: A life satisfaction approach. *Social indicators research, 103*(3), 409-426. doi:https://doi.org/10.1007/s11205-010-9709-1

[20] Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment, 49*(1), 71-75. doi:https://doi.org/10.1207/s15327752jpa4901_13

[21] Diener, E., Inglehart, R., & Tay, L. (2013). Theory and validity of life satisfaction scales. *Social indicators research, 112*(3), 497-527. doi:https://doi.org/10.1007/s11205-012-0076-y

[22] Diener, E., Wolsic, B., & Fujita, F. (1995). Physical attractiveness and subjective well-being. *Journal of personality and social psychology, 69*(1), 120. doi:https://doi.org/10.1037/0022-3514.69.1.120

[23] Doyle, A. (2021, March 23rd). Average Salary Information for U.S. Workers. Retrieved from https://www.thebalancecareers.com/average-salary-information-for-us-workers-2060808

[24] Duesenberry, J. S. (1949). *Income, saving, and the theory of consumer behavior.*

[25] Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*(1), 35-47. doi:https://doi.org/10.1016/0167-2681(95)00003-B

[26] Festinger, L. (1954). A theory of social comparison processes. *Human relations, 7*(2), 117-140. doi:https://doi.org/10.1177/001872675400700202

[27] Festinger, L. (1957). Social comparison theory. *Selective Exposure Theory*, 16.

[28] Fonberg, J., & Smith, A. P. (2019). The validity of a single question about life satisfaction. *International Journal of Arts, Humanities and Social Sciences, 4*, 38-44.

[29] Frank, R. H. (2005). Are concerns about relative income relevant for public policy? Positional Externalities Cause Large and Preventable Welfare Losses. *The American Economic Review, 95*(2), 137. doi:https://doi.org/10.1257/000282805774670392

[30] Frieswijk, N., Buunk, B. P., Steverink, N., & Slaets, J. P. (2004). The effect of social comparison information on the life satisfaction of frail older persons. *Psychology and aging, 19*(1), 183. doi:https://doi.org/10.1037/0882-7974.19.1.183

[31] Glen, S. Kaiser-Meyer-Olkin (KMO) Test for Sampling Adequacy. Retrieved from https://www.statisticshowto.com/kaiser-meyer-olkin/

[32] Grolleau, G., Mzoughi, N., & Saïd, S. (2012). Do you believe that others are more positional than you? Results from an empirical survey on positional concerns in France. *The Journal of Socio-Economics, 41*(1), 48-54. doi:https://doi.org/10.1016/j.socec.2011.10.001

[33] Hillesheim, I., & Mechtel, M. (2013). How much do others matter? Explaining positional concerns for different goods and personal characteristics. *Journal of Economic Psychology, 34*, 61-77. doi:https://doi.org/10.1016/j.joep.2012.11.006

[34] Hirsch, F. (1977). Social limits to growth, 1976. *Cambridge MA: Harvard University Press), pgs, 87*, 105. doi:https://doi.org/10.4159/harvard.9780674497900

[35] JATOS. Retrieved from https://www.jatos.org/

[36] Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: a meta-analysis. *Journal of personality and social psychology, 102*(3), 592.

[37] Luttmer, E. (2005). Neighbors as negatives: Relative earnings and well-being. *The Quarterly Journal of Economics, 120*(3), 963-1002. doi:https://doi.org/10.1162/003355305774268255

[38] Maslow, A. H. (1943). A theory of human motivation. *Psychological review, 50*(4), 370. doi:https://doi.org/10.1037/h0054346

[39] Maye, A. (2019). No-vacation nation, revised. *Center for Economic and Policy Research*, 1-12.

[40] McAdams, R. H. (1992). Relative preferences. *Yale Law Journal*, 1-104.

[41] Meara, E. R., Richards, S., & Cutler, D. M. (2008). The gap gets bigger: changes in mortality and life expectancy, by education, 1981–2000. *Health affairs, 27*(2), 350-360. doi:https://doi.org/10.1377/hlthaff.27.2.350

[42] Pallett, P. M., Link, S., & Lee, K. (2010). New "golden" ratios for facial beauty. *Vision research, 50*(2), 149-154. doi:https://doi.org/10.1016/j.visres.2009.11.003

[43] Prolific. Retrieved from https://prolific.co/

[44] Ray, R., Sanes, M., & Schmitt, J. (2013). No-vacation nation revisited. *Center for Economic and Policy Research*, 1-22.

[45] Roth, B., Hahn, E., & Spinath, F. M. (2017). Income inequality, life satisfaction, and economic worries. *Social Psychological and Personality Science, 8*(2), 133-141. doi:https://doi.org/10.1177/1948550616664955

[46] Schimmack, U., & Oishi, S. (2005). The influence of chronically and temporarily accessible information on life satisfaction judgments. *Journal of personality and social psychology, 89*(3), 395. doi:http://dx.doi.org/10.1037/0022-3514.89.3.395

[47] Senik, C. (2009). Direct evidence on income comparisons and their welfare effects. *Journal of Economic Behavior & Organization, 72*(1), 408-424.

[48] Simon, H. A. (1957). Models of man; social and rational. doi:https://doi.org/10.2307/2550441

[49] Solnick, S. J., & Hemenway, D. (1998). Is more always better?: A survey on positional concerns. *Journal of Economic Behavior & Organization, 37*(3), 373-383. doi:https://doi.org/10.1016/S0167-2681(98)00089-4

[50] Solnick, S. J., & Hemenway, D. (2005). Are positional concerns stronger in some domains than in others? *American Economic Review, 95*(2), 147-151. doi:https://doi.org/10.1257/000282805774669925

[51] Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom, and with what effect? *Current Directions in Psychological Science, 11*(5), 159-163. doi:https://doi.org/10.1111/1467-8721.00191

[52] Trostel, P. A. (2005). Nonlinearity in the return to education. *Journal of Applied Economics, 8*(1), 191-202. doi:https://doi.org/10.1080/15140326.2005.12040624

[53] Veblen, T. (1899). *The theory of the leisure class*.

[54] Wheeler, L., & Miyake, K. (1992). Social comparison in everyday life. *Journal of personality and social psychology, 62*(5), 760.

Appendix A

A.1 Survey measures

A.1.1. Positionality domains

A.1.1.1. Monthly income

You earn a certain amount before taxes every month from your full-time job. The prices are identical in all states; only your wage varies.

Gamma = 0.25

A. Your income is **USD 4,900** before taxes every month. In society, people earn on average **USD 5,500** each month before taxes.

B. Your income is **USD 4,100** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes.

C. Your income is **USD 4,100** before taxes every month. In society, people earn on average **USD 4 100** each month before taxes.

D. All of the options are equally good to me.

Gamma = 0.375

A. Your income is **USD 4,900** before taxes every month. In society, people earn on average **USD 5,500** each month before taxes.

B. Your income is **USD 3,700** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes.

C. Your income is **USD 3,700** before taxes every month. In society, people earn on average **USD 3,700** each month before taxes.

D. All of the options are equally good to me.

Gamma = 0.50

A. Your income is **USD 4,900** before taxes every month. In society, people earn on average **USD 5,500** each month before taxes.

B. Your income is **USD 3,300** before taxes every month. In society, people earn on average **USD 2,300** each month before taxes.

C. Your income is **USD 3,300** before taxes every month. In society, people earn on average **USD 3,300** each month before taxes.

D. All of the options are equally good to me.

A.1.1.2 Physical attractiveness

When looking in the mirror, we all have some notion about how attractive we are in the face o f others. The prices are identical in all states; only your attractiveness varies.

Gamma = 0.25

A. Your physical attractiveness score is **80/100** on the scale. The average physical attractiveness score in your society is **93/100**.

B. Your physical attractiveness score is **68/100** on the scale. The average physical attractiveness score in your society is **45/100**.

C. Your physical attractiveness score is **68/100** on the scale. The average physical attractiveness score in your society is **68/100**.

D. All of the options are equally good to me.

Gamma = 0.375

A. Your physical attractiveness score is **80/100** on the scale. The average physical attractiveness score in your society is **93/100**.

B. Your physical attractiveness score is **62/100** on the scale. The average physical attractiveness score in your society is **45/100**.

C. Your physical attractiveness score is **62/100** on the scale. The average physical attractiveness score in your society is **62/100**.

D. All of the options are equally good to me.

Gamma = 0.50

A. Your physical attractiveness score is **80/100** on the scale. The average physical attractiveness score in your society is **93/100**.

B. Your physical attractiveness score is **56/100** on the scale. The average physical attractiveness score in your society is **45/100**.

C. Your physical attractiveness score is **56/100** on the scale. The average physical attractiveness score in your society is **56/100**.

D. All of the options are equally good to me.

A.1.1.3 Paid vacation days

Each year you get a certain amount of paid leave. The prices are identical in all states; only your amount of paid vacation varies.

Gamma = 0.25

   A. Every year, you get **26 days of paid vacation.** In society, the average worker gets **30 days of paid vacation.**
   B. Every year, you get **22 days of paid vacation.** In society, the average worker gets **14 days of paid vacation.**
   C. Every year, you get **22 days of paid vacation.** In society, the average worker gets **22 days of paid vacation.**
   D. All of the options are equally good to me.

Gamma = 0.375

   A. Every year, you get **26 days of paid vacation.** In society, the average worker gets **30 days of paid vacation.**
   B. Every year, you get **20 days of paid vacation.** In society, the average worker gets **14 days of paid vacation.**
   C. Every year, you get **20 days of paid vacation.** In society, the average worker gets **20 days of paid vacation.**
   D. All of the options are equally good to me.

Gamma = 0.5

   A. Every year, you get **26 days of paid vacation.** In society, the average worker gets **30 days of paid vacation.**
   B. Every year, you get **18 days of paid vacation.** In society, the average worker gets **14 days of paid vacation.**
   C. Every year, you get **18 days of paid vacation.** In society, the average worker gets **18 days of paid vacation.**
   D. All of the options are equally good to me.

A.1.2 Social demographic indicators

1) What is your gender? (man, woman, other, no answer)

2) What is your birth year? (1944 or earlier, 1945, …, 2003)

3) Do you have children? (yes, no, no answer)

4) What is your monthly income before tax? (USD 499 or less, 500–999, 1001–1500, …, 9501–10,000, 10,001 or more) (domain relevant)

5) Do you hold a university degree? (yes, no, no answer)

6) How many days of paid vacation do you have each year? (5 days or less, 6 to 10 days, …, 21 to 25 days, 26 or more days, no vacation days, no answer) (domain relevant)

7) Are you currently employed? (yes, no, no answer)

8) If we could measure physical attractiveness on a 1–100 scale, where would you place yourself? (0–5, 6–10, 11–15, …, 96–100, no answer) (domain relevant)

A.1.2 Life satisfaction

1) In most ways my life is close to my ideal.

2) The conditions of my life are excellent.

3) I am satisfied with my life.

4) So far, I have gotten the important things I want in life.

5) If I could live my life over, I would change nothing.

A.2 Tables

A.2.1 Regression results pretest analysis

Table A1: Correlates of GLS/OSL regressions with SWLS (factor) as dependent variable. Standard errors in parentheses

	SWLS (GLS)	SWLS (OLS)
Positionality dummies		
Income	-0095	-0.095
	(0.057)	(0.057)
House	-0.046	-0.046
	(0.066)	(0.067)
Apartment	0.058	0.058
	(0.072)	(0.054)
SAT score	-0.057	-0.057
	(0.054)	(0.051)
Vacation days	-0.065	-0.065
	(0.060)	(0.061)
Socio-demographics		
Female	0.096	0.096
	(0.051)	(0.051)
Children	-0.158*	-0.158*
	(0.051)	(0.063)
Grandchildren	-0.110	-0.110
	(0.076)	(0.076)
Higher education degree	-0.138*	-0.138*
	(0.062)	(0.062)
Income	0.089***	0.089***
	(0.009)	(0.009)
Vacation days	0.043**	0.043**
	(0.014)	(0.014)
SAT score	0.003	0.003
	(0.005)	(0.005)
Home size	0.018*	0.018*
	(0.008)	(0.008)
Student	-0.239**	-0.239**
	(0.088)	(0.089)
Age	0.004	0.004
	(0.002)	(0.002)
Constant	0.310	0.310
	(0.268)	(0.270)
N	1119	1119
R^2		0.2120
AIC	2.497022	
BIC	-6969.915	

* p<0.05 ** p<0.01 *** p<0.001

SWLS is abbreviated from Satisfaction With Life Scale

OLS is abbreviated from Ordinary Least Squares

GLS is abbreviated from Generalized Least Squares

A.2.2 Ordinary least square regression

Table A2: Correlates of ordinary least square regression with SWLS (factor) as dependent variable. Standard errors in parentheses

	SWLS (vacation)	SWLS (income)	SWLS (attractive)
Positionality			
Gamma = 0.25	-0.295	-0.372**	-0.252
	(0.257)	(0.129)	(0.138)
Gamma = 0.375	0.057	-0.211	-0.501**
	(0.149)	(0.175)	(0.144)
Gamma = 0.50	-0.189	-0.166*	-0.247**
	(0.096)	(0.072)	(0.075)
Egalitarian			
Gamma = 0.25	-0.121	-0.083	-0.417***
	(0.109)	(0.098)	(0.119)
Gamma = 0.375	0.234*	-0.118	-0.201
	(0.109)	(0.226)	(0.109)
Gamma = 0.50	-0.122	-0.082	0.012
	(0.083)	(0.093)	(0.087)
Socio-demographics			
Female	0.095	0.091	0.080
	(0.061)	(0.060)	(0.060)
Children	-0287***	-0.278***	-0.281***
	(0.069)	(0.060)	(0.068)
Employed	-0.004	-0.005	0.001
	(0.079)	(0.076)	(0.079)
Higher education degree	-0.158*	-0.158*	-0.159*
	(0.070)	(0.070)	(0.069)
Income	0.027***	0.027***	0.026***
	(0.005)	(0.005)	(0.005)
Vacation days	0.012**	0.012**	0.012***
	(0.004)	(0.004)	(0.004)
Attractiveness	0.071***	0.070***	0.071***
	(0.010)	(0.010)	(0.000)
Age	0.005*	0.005*	0.005*
	(0.002)	(0.019)	(0.002)
Ordering effects	-0.091	-0.074	-0.084
	(0.058)	(0.058)	(0.058)
Constant	0.091**	0.757**	0.710***
	(0.058)	(0.271)	(0.267)
N	859	859	859
R^2	0.2533	0.2517	0.2689

* p<0.05 ** p<0.01 *** p<0.001
SWLS is abbreviated from Satisfaction With Life Scale