



# Seeing the forest to save the trees

An experiment on the effect of psychological distance on sustainable investing preferences



**Cover image: *Untitled (Yellow, Green, White, and Blue on Blue)***

by Steve Johnson, 2018

Durkin and her colleagues (2020) found that abstract art evokes psychological distance. When we observe abstract art, our brains do not recognize many details that cue what we are looking at. Instead, we will be looking for *meaning* in the artwork. Observing abstract art leads to more abstract thinking as opposed to observing representative artwork that depicts recognizable objects.

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## Abstract

To address the climate crisis on a societal level we need to understand how citizen behaviour can contribute to sustainable goals. Private investing offers a promising case of potential sustainable citizen behaviour. However, former research has pointed out that citizens do not always translate their sustainable values into action. Insight into the hurdles citizens face in acting on their values is needed for optimizing sustainable investing behaviour. This study pioneers in investigating the decision-process of sustainable private investing and specifically the translation of values into preferences. The existing insights into the drivers that underlie sustainable investing are scarce and inconsistent. Theory of psychological distance might explain the inconsistencies of these insights. Psychological distance is expected to increase the weight one places on values, such as sustainability, versus practicality concerns. It is therefore hypothesised that investors have more sustainable preferences when they consider an investment they perceive higher psychological distance to. A 2x2 factorial survey experiment among a representative sample of Dutch private investors tests this assumption for the four dimensions of psychological distance: temporal, spatial, social, and hypothetical distance. Results do not provide evidence of an effect of psychological distance for investment preferences. Rather, participants express their sustainable values in their preferences, invariant for the level of psychological distance. Methodological considerations could explain these results, however to a limited extent. It is well possible that psychological distance does not have a true effect in real financial decision-making environments. The results imply that psychological distance theory, mostly tested in controlled settings, do not generalise to more contextualised and/or financial settings. The study moreover indicates that citizens do use easy-view information, but neglect other when they make investment decisions. Most importantly, this study implies that individuals are capable of translating sustainable values into investment preferences. This insight emphasizes the large potential of sustainable citizen behaviour for navigating the climate crisis.

**Keywords:** sustainable investing, psychological distance, construal level theory, value-action gap

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# 1 Introduction

The climate crisis is one of the defining governance issues of our time (Jordan et al., 2010). Amongst all actors, it requires individuals to adapt their behaviour to reach the climate goals as stated in the Paris Climate Agreement of 2015 (Hoffman, 2011). Sustainable citizen behaviour has therefore been of interest of public administration scholars (e.g. Dessart et al., 2019; Frederiks et al., 2015). Private, that is individual, investing, appears as another area next to housing, travel and food consumption where citizen behaviour can contribute to sustainable development. In Europe, sustainability themed investments grew with 146% between 2013 and 2015 (Eurosif, 2016). This trend has continued the years thereafter (Eurosif, 2018) and is similarly observable in the United States (US SIF, 2016). 57% of private investors take sustainability into account in their investment choices (Schroders, 2019), for example by including sustainability scores (Amel-Zadeh et al., 2020). Around half of the private investors believe investing sustainably can contribute to a more sustainable world (Schroders, 2019). They are even willing to accept lower returns and higher costs for sustainable investments (Riedl & Smeets, 2017; Bauer et al., 2019). Sustainable investment behaviour is thus of large potential value on our road to a sustainable future.

Utilising the full potential of sustainable investing requires citizens to act on their sustainable values. This is not as easy as it sounds. Individuals are only boundedly rational (Simon, 1957; Selten, 1990). Cognitive boundaries form hurdles for citizens to first translate values into preferences, and subsequently translate preferences into behaviour. The result, a discrepancy between values and behaviour, is one of the key puzzles for public policy scholars and has been labelled the 'value-action-gap' (Blake, 1999). The Dutch Scientific Council for Government Policy (WRR, 2017) hence states that individuals are limited in their 'action capacity'. As for sustainability, citizens express high environmental concern. In reality, however, their values transcend their actual behaviour (Ministry of Economic Affairs and Climate Policy, 2019). This not only leads to individual pity (Ministry of Economic Affairs and Climate Policy, 2019): the impediment of sustainable goals also forms a societal threat.

We need to investigate the individual decision-making process that underlies sustainable investing. The scarce attention of public administration for investing is surprising, as governance of climate change requires action at all levels: the private sector cannot be excluded from studying this issue (Jordan et al., 2010). Non-governmental actors, such as businesses and citizens alike, can be part of societal steering towards sustainability goals. We therefore need to understand micro-level processes, that is individual behaviour, if we want to grasp macro-level, that is societal, issues (Jilke, 2015). We so far know that next to socio-psychological factors (Puaschunder, 2011; Riedl & Smeets, 2017) and a pro-social attitude (Nilsson, 2008), expected return also plays a role (Døskeland & Pedersen, 2016; 2019; Jansson & Biel, 2011) for sustainable investing. Gutsche et al. (2016) find that both perceived financial performance and values and norms are at play. Research is thus not univocal. It shows a remarkable variation in the importance of considerations as sustainable values and financial motives.

The variant findings on the sustainable investing decision-making process not only creates a theoretical hiatus. It also leaves financial conduct supervisors groping in the dark for their task to prevent from citizen exploitation. Firms might anticipate on cognitive boundaries of citizens who consider sustainable investing, and eventually exploit these boundaries. 'Greenwashing' is an example of such exploitation: companies or funds use the marketing value of a sustainable label without actually making sustainable contributions (Authority for the Financial Markets, 2020). To effectively prevent citizen exploitation in this realm, supervisors need insight into the exact cognitive boundaries at play in the decision-making process of sustainable investing.

Theory of psychological distance might increase understanding in the sustainable investing decision-making process. It can explain the inconsistencies in the drivers of sustainable investing. This theory namely holds that we act more in accordance with our values and morality when we have more “psychological distance” (Eyal et al., 2009; Kivetz & Tyler, 2007; Danziger et al., 2012; Agerström & Björklund, 2009a; 2009b; 2012; Giacomantio et al., 2010). Psychological distance is the distance we perceive to an object, an event, or a decision (Trope & Liberman, 2010). Psychological distance is introduced when something is removed from our direct experience, either in time, space, social identification, or hypotheticality of happening (Trope & Liberman, 2010). Thus, we perceive more distance to spending our money not now, but in a year, not in our hometown, but at a distant location, not for ourselves, but for someone else, and not for a set choice, but for uncertain choice options. It is distance-dependent what information we use for our considerations (Ledgerwood et al., 2010b; Trope & Liberman, 2010; Soderberg et al., 2015; Brügger, 2020): psychological distance influences whether we pay attention to the whole, or to details. In other words: it determines whether we see the forest, or the trees. The weight of some ‘arguments’, such as values (Eyal et al., 2009), increases with more psychological distance. Information on sustainability, which appeals to values, would thus be more important when we perceive more distance to an investing decision. When seeing the metaphorical forest rather than the trees, we would care more about sustainability.

Our understanding of sustainable investing decision-making processes can be enlarged by the explanation that values are of variant importance depending on the perceived distance. It is time to put this promising explanation to the test. This paper seeks to answer the following research question: *“Does psychological distance increase investor preferences for sustainable investments?”*. Theories of psychological distance and construal level theory (CLT) are applied to unravel sustainable investment decision-making. A survey experiment among Dutch investors tests whether the importance translation of sustainable values into sustainable preferences depends on psychological distance to an investment fund. This study zooms into the first step of the decision-making process, namely from values to preferences. The step thereafter, from preferences into behaviour, is beyond the current study’s scope. This study thereby pioneers in testing the explanatory value of psychological distance theory for sustainable investing.

This study contributes to our current body of knowledge in several ways. Firstly, the perspective of psychological distance further develops the field of Behavioural Public Administration (BPA), which studies how individual behaviour relates to public policymaking and is thus concerned with the behaviour of individuals, be it citizens, public officials, or managers, underlying societal issues (Jilke, 2015; Grimmelikhuijsen et al., 2017). Even though addressing the climate crisis does require individuals to change their behaviour (Hoffman, 2011), BPA has only had scarce attention for sustainable behaviour. Moreover, psychological insights that have so far been integrated into the discipline stem from prospect theory (Kahneman and Tversky, 1979; used by e.g. Vis, 2011; Meier et al., 2015; Baekgaard, 2017; Bellé et al., 2018), work on heuristics (Gilovich et al., 2002; used by e.g. Stolwijk & Vis, 2020), pro-social motivation theory (Batson, 1987; Grant & Berg, 2012; used by e.g. Favero & Pedersen, 2020) and theory on motivated reasoning (Kunda, 1990; used by e.g. James & Van Ryzin, 2017; Baekgaard & Serritzlew, 2016; Jilke & Baekgaard, 2020). The useful insights generated by the application of these theories showcase the importance for public administration to further integrate psychological insights into the discipline, for example theories of psychological distance and CLT.

Psychological distance theory seems particularly valuable for public administration questions, because many societal issues require citizens to behave according to long-term or social goals rather than short-term individual profit. The only efforts have so far been made by Ritz et al. (2020), who use

psychological distance and CLT in their study on public service motivation and prosocial motivation; and by Huang and Shen (2020), who test the conditions in which psychological distance leads to more policy support for solar panels. The novel application of psychological distance theory better equips public administration scholars to analyse individual aspects underlying societal issues, such as sustainability.

Secondly, the study is one of the first to test psychological distance theory in the realm of financial decision-making. Although Soderberg et al. (2015) find robust effects of psychological distance, it is unknown whether these effects also apply to the financial domain. Financial decisions in particular have been argued to be unique. They are difficult to imagine for consumers and the far-off character of financial decisions has been argued to lead to disengagement, wrong choices, and inertia (Agarwal & Mazumder, 2013; Erev & Haruvy, 2013). Findings into the effects of psychological distance can thus not be generalised untested to financial decisions. The few that have studied psychological distance theory in the financial decision context are Bornemann and Homburg (2011), who studied the effect of psychological distance on the perception of price, and Chang et al. (2015), who studied the effect on psychological distance on attitudes and purchase intention for sustainable products. This study strengthens the foundations of psychological distance theory in financial decision-making laid out by these studies.

Thirdly, this study's focus on values as a high level construct responds to the call by Mårtensson (2017) that the importance of morality and values could be tested more. Some studies namely do not (Gong & Medin, 2012) or only partly (Žeželj & Jokić, 2014) replicate the findings of Eyal and colleagues (2009) that people form more severe moral judgements when they perceive more psychological distance. This study could provide clarity into this undecided debate as morality and values are understood as closely linked in literature (e.g. Eyal et al., 2009). Moreover, this study advances psychological distance theory in general by testing different dimensions of psychological distance. Most research on psychological distance focusses on temporal and spatial distance, to a lesser extent on social distance and smallest extent on hypothetical distance (Soderberg et al., 2015). This study also includes the less tested dimensions of social and hypothetical distance.

This study lastly contributes to the practice of policymakers. Knowledge of the barriers creating a value-action gap is needed to help citizens overcome this gap. Especially for complex choices, like financial choices often are, citizens might need a hand to increase their action capacity (WRR, 2017). Moreover, the popularity of sustainable investing gives way for exploitation of citizen behaviour. The risk of greenwashing practices, as mentioned above, becomes more real in the light of findings that citizens are willing to accept lower returns for sustainable funds (Riedl & Smeets, 2017; Bauer et al., 2019), financially incentivizing firms to exploit the sustainability label. By an increased understanding of the sustainable investing decision-making process, this study supports regulators to effectively protect citizens against exploitation of this (cognitively bounded) process. In the long run, prevention of exploitation also should consolidate citizen trust in the financial sector as a whole (as stated in the mission of e.g. the Dutch AFM or the British FCA), ensuring stability of our financial markets.

The remainder of this paper proceeds as follows. The next section elaborates on the theories of psychological distance and construal level and their explanatory value for investing preferences. The method section then sets out how the hypotheses were put to the empirical test with a survey experiment. Next, the findings of this experiment are presented. The paper lastly concludes whether psychological distance matters for sustainable investing, as well as it discusses the theoretical and practical meaning of this conclusion.



## 2 Conceptualising psychological distance

The psychology of human decision-making has long been of interest of public administration scholars. Psychological theories of prospect theory, theory on biases and heuristics, and motivated reasoning have been adapted by the field of public administration. In common with these theories, theory of psychological distance departs from the notion of bounded rationality (Simon, 1957): individuals do not consider all the information available to them, hence behaviour is not always rational. The ‘irrationality’, present in the different theories, is explained in a slightly different way. Prospect theory holds that individuals weigh losses differently than benefits. Theory of biases and heuristic holds that, while individuals might sometimes engage in effortful thinking, they often take ‘mental shortcuts’ in which biases help them to make fast decisions. Psychological distance theory, on the other hand, does not distinguish between such processes. Instead, it holds that information is weighed inconsistently, depending on the distance one perceives to a decision. This section will further explain that line of reasoning by setting out theories of psychological distance and mental construal level.

### 2.1 *Psychological distance and Construal Level Theory*

Construal level theory (CLT) (Trope & Liberman, 2003; 2010) theorises that the human mind can construct objects and events at different abstraction levels, from very detailed to very abstract. The level of construal is thought to interact with psychological distance. Psychological distance is the distance one perceives to a certain matter (Trope & Liberman, 2010), a definition generally agreed on in literature and taken as definition for this study too. Psychological distance is egocentric, in the sense that “people directly experience only the here and now” (Trope & Liberman, 2010: 440). Anything that moves further away from direct experience introduces psychological distance from that matter. The more psychological distance one experiences, the more abstract the matter is mentally construed. It is assumed that individuals differ in their tendency to form detailed or abstract construals (Trope & Liberman, 2014). Nevertheless, mental construal levels are assumed to be dynamic: both psychological distance and the mental construal level can change (Trope & Liberman, 2010). Mental construals thus seem to be both person- and situation-dependent. The relation between mental construal level and psychological distance is bidirectional (Bar-Anan et al., 2006; Liberman et al., 2007; Trope & Liberman, 2010). Psychological distance affects the construal level, but the construal level also affects the psychological distance one perceives. Where psychological distance is a perception of how far away something is, the mental construal should be understood as the mental representation or ‘picture’ of that matter.

What does it mean that events can be construed at different levels? Construal levels matter for perceptions, evaluations, and decisions. This is due to the dynamic salience of features (Trope & Liberman, 2010; Soderberg et al., 2015). The construal level determines what elements of the mental construal stand out. When abstract, the mental construal is like a ‘bigger picture’: one sees a matter in a hierarchy with other elements. The activity of someone in the library would be marked as ‘studying’. When detailed, hierarchy evades and elements are represented more at the same level (Trope et al., 2007). The activity in the library would be marked as ‘typing on a laptop’.

### 2.2 *The relative salience of features*

Some elements therefore become more salient at a higher construal level, while being represented at the same level as other elements at a lower construal. These elements are labelled ‘primary or ‘central’

features (Trope & Liberman, 2010). The elements that become relatively less salient at a high construal level are labelled 'secondary', 'contextual', 'incidental' or 'peripheral' features (Eyal et al., 2009; Trope & Liberman, 2010). Thus, a low mental construal is rich in detailed information, of which some information consists of secondary features, while central features become more visible in the abstract, detail-lacking high mental construal (Eyal et al., 2009). The more psychological distance, the more an event will be represented with a few general features that capture the essence of the event. With less psychological distance, the representation will include more contextual and incidental aspects of the event (Trope & Liberman, 2003). Psychological distance thus increases the relative impact of primary (versus secondary) information on evaluation, behaviour, and prediction (Soderberg et al., 2015). Kim et al. (2009) even found that consumers with low psychological distance to a product evaluate a product that is negative on primary features, but positive on secondary features, better than a product that is positive on primary features, but negative on secondary features. Todorov et al. (2007) conclude that psychological distance to an outcome "can change the relative salience of attributes". Primary features of investments would thus become of more importance when distance to the investment increases.

What are these primary features of investments, then? The specific primary or secondary features differ per matter. However, categories of features have been theorised as primary or secondary features. Desirability is considered more important at high construal levels, versus feasibility at low construal levels (Liberman & Trope, 1998; Trope & Liberman, 2003; 2010). The ends of an action ('why') are considered a primary feature, the means to that end ('how') a secondary feature (Danziger et al., 2012). Pros are primary features, cons are secondary features, hence pros weigh more heavily at a high construal while pros and cons are weighed evenly at a low construal (Eyal et al., 2004). Investment options thus contain an array of features of which some are categorised primary and some are categorised secondary.

Values, such as sustainability, are another example of a primary feature, while situation-specific demands ('practicality') are secondary features (Eyal et al., 2009). A value is "a desirable transsituational goal varying in importance, which serves as a guiding principle in the life of a person or other social entity" (Schwartz, 1992: 21). Values, being 'trans-situational', thus have a common meaning to many different situations and are abstract (Eyal et al., 2009). Exactly because values are abstract and decontextualized in nature, they "will be more readily applied to and guide intentions for psychologically distant situations" (Trope & Liberman, 2010: 453). Values are thus considered a primary feature. When a matter is psychologically close and the construal level is low, values are construed at the same level as other (secondary) features, such as feasibility or practicality. When more psychological distance is perceived and the consequent mental construal of the matter is high, values become relatively more important. In other words: values 'stand out' at high construal levels.

That values are indeed a primary feature is shown by several studies. Eyal and colleagues (2009) test the weight of values versus feasibility features. They conclude that "values are more likely to be activated when considering more distant future situations". Kivetz and Tyler (2007) find that a more idealistic 'self' is activated with a distant condition, whereas a pragmatic self is activated with a proximate condition. Parallel to this finding, Giacomantio et al. (2010) find that people behave more corresponding to their values if they operate under a high construal level than under a low construal level. Danziger et al. (2012) find that idealistic considerations are relatively more important at high construal levels, while pragmatic considerations are relatively more important at low construal levels. More weight is placed on moral concerns for distant events than for near events (Agerström & Björklund, 2009a; 2009b; 2012). We thus assume values as a primary feature to become more important for investment preferences when more distance to the investment is perceived.

As values weigh relatively more in high construal levels and when more psychological distance is introduced, we expect that this applies to sustainability as a value too. In one of their studies, Trope et al. (2007) conceptualise sustainability (eco-friendliness of products) as a value-related feature. Environmental values concern the attitude towards the relationship between human and nature (UNESCO, 2010). Thinking that the environment is important, as 90% of the Dutch population does, (Statistics Netherlands, 2018), indicates environmental concern (Van Liere & Dunlap, 1981; Washington, 2015; Washington et al., 2017). Sustainability has therefore been understood as intrinsic value or ideology in other studies of sustainable behaviour (e.g. Hamari et al., 2016; Sordi et al., 2018; Van Dam & Van Trijp, 2013; 2016). Similar to values, sustainability is thought to adhere to abstract concepts in essence (Spence & Pidgeon, 2010; Spence et al., 2012) and thus to be a more apparent feature at high construal levels (Reczek et al., 2018). Sustainability is understood to be represented as a value, and thus as a primary feature, in a mental construal. Hence, sustainability should become a more important driver for investment decision-making when investors perceive more psychological distance. In this study, sustainability will therefore be considered as a primary feature of investments.

Though rather scarce, psychological distance theory does yield some criticism. Firstly, Trautmann and Van de Kuilen (2012) evaluate the theory of limited predictive value when compared to prospect theory for situations of risky decisions. The authors find that prospect theory predicts most of the evidence, even when levels of psychological distance vary. Secondly, Brügger (2020) argues that the relevance of psychological distance theory and Construal Level Theory remains limited for studying distant phenomena. The theory remains quite general, while actually tying it to specific and observable matters would enhance its value for studying those matters. A last point of debate concerns the status of morality as a primary feature. Gong and Medin (2012) and Žeželj and Jokic (2014) namely find that the study of Eyal et al. (2009) on morality as more important at high psychological distance does not (entirely) replicate. The replications of morality suggest some ambiguity of evidence on primary features. More generally, this can be understood as illustration that psychological theories, though carefully developed, might not always hold when replicated. Although this observation does not discredit the vast body of literature on psychological distance and its primary features, such as values, it is a signal the current and future studies using psychological distance should be conscious of. We will now investigate what can be expected about sustainable investing preferences when psychological distance theory is applied.

### 2.3 Causal model and hypotheses

Without theory of psychological distance, we would expect considerations to weigh equally heavily for different investment situations. However, when theory of psychological distance is applied to investing preferences, it follows that the more psychological distance an individual experiences to an investment, the higher one's construal level of the investment is, the more sustainability will matter for the preferences. Figure 1 shows this causal chain as put forward by theory.

Psychological distance → Mental construal level → Relative weight of value features → Investment preferences
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*Figure 1: theorised causal chain*

Psychological distance is experienced on a number of dimensions: temporal distance, spatial distance, social distance, and hypotheticality distance. When something is happening in a year (versus tomorrow), in another country (versus your own), to/by people who are not like you (versus who are) with low likelihood (versus with certainty), one constructs the matter more abstractly, and most abstract when something is distant on all these levels.

As subsequently presented, this study hypothesises the presented causal chain for these different dimensions of psychological distance. The vast body of literature agrees that there are four dimensions: temporal, spatial, social, and hypothetical distance. As they share a common egocentric point of reference, it is assumed that they all similarly influence the construal level (Soderberg et al., 2015). It is agreed on though that the four so-far well conceptualised dimensions are distinct (Trope & Liberman, 2010), yet interrelated (Bar-Anan et al., 2007; Liberman et al., 2007): “they are associated with each other, affect each other, and add to each other to produce a unified sense of distance” (Liberman & Trope, 2014: 368). This is supported by findings of Fiedler et al. (2012), who find that distance on one dimension positively contributes to distance on the other.

There are a couple of undecided conceptual discussions. Investigating those is beyond the scope of this study, but for matters of completeness, they are mentioned here. Remarkable results are presented by Zhang and Wang (2009). They find that spatial distance does increase psychological distance on the other three dimensions, but that the effect is not observable the other way around. The effect of distance perceived at one dimension on other dimensions thus remains debatable. Another ongoing conceptual discussion is to what extent their effects are indeed comparable, or whether, for example, temporal distance has a stronger effect than social distance, which was found by Kim et al. (2008). In addition, it remains the question what the shape of the relation between psychological distance on multiple dimensions on construal levels looks like: are its effects cumulative, or inflated or deflated? Maglio et al. (2013) find that there is a larger difference between ‘near’ and ‘far’ than between ‘far’ and ‘further’, however the additional effects of distance on multiple dimensions remains unclear.

The current study focusses on the four agreed on and theoretically grounded dimensions. It assumes that these four dimensions are all subject to the same psychological distance mechanism, yet are distinct dimensions. Firstly, the hypothesised causal model is applied to temporal psychological distance, the distance dimension that has been at the foundation of psychological distance theory. Several studies found that events that are further away in the future, thus at more temporal distance, are represented by a higher level construal (e.g. Liberman et al., 2002; Wakslak et al., 2006a; Liberman & Trope, 1998; Day & Bartels, 2004; Nussbaum et al., 2003, Förster et al., 2004; Fujita et al., 2008; Kim et al., 2009; Eyal et al., 2009). In a meta-analysis, Soderberg et al. (2015) find that the effect of temporal distance changes curvilinearly to the increased temporal distance: the experienced psychological distance or the abstraction of the construal level increases more rapidly than the ‘objective’ manipulated temporal distance. Temporal distance is often introduced in real-life financial decisions: for example in Dutch pension policies, citizens already indicate their preferred pension turnout scheme 15 years before they retire. For investments, it would mean that when considering investing in the future, one would experience higher psychological distance, hence sustainability as a value would weigh relatively more. This study thus hypothesises:

*H1: Temporal psychological distance affects preferences for sustainable investments. The more temporal distance, the more likely one is to prefer a sustainable fund.*

Secondly, psychological distance applies to space. The more spatial distance from something or an event is perceived, the higher it is mentally construed (Fujita et al., 2006; Fujita et al., 2008; Henderson et al., 2006). For example, the event of locking a door was represented in low mental construals (e.g. as putting a key in the lock) when the event was located nearby. When it was located further away, it was described in high level construals (e.g. securing the house) (Fujita et al., 2006). The same was found for descriptions of a campus video (Fujita et al., 2008). The spatial dimension is relevant to investing decisions too: the stock market is highly globalised, hence the location of and the spatial distance to an investment highly varies. Spatial distance means that sustainability would dominate

ones preferences relatively more when the investments is considered for funds or firms that are spatially further away. For this dimension, this study hence hypothesises:

*H2: Spatial psychological distance affects preferences for sustainable investments. The more spatial distance, the more likely one is to prefer a sustainable fund.*

Thirdly, the egocentrism that is central to psychological distance literally applies to psychological distance in the social domain, or social psychological distance. It is thought that psychological distance decreases the more one identifies with someone. What follows is that if something is considered for oneself, one has littler psychological distance than if something is considered for another (Liviatan et al., 2008; Smith & Trope, 2006; Kim et al., 2009). Moreover, Kim et al. (2009) found that the same logic applies to in- and out-group dynamics: people have a low psychological distance to matters related to their own group, while they experience high psychological distance to matters relevant for out-group individuals. Some studies seem to confuse social and spatial distance.

Spence et al. (2012) for example understand an event in a developing country as introducing social distance. Although this of course links to the extent of identification with others, this study more concisely follows the definition of social distance as related to persons (rather than the places those persons are). Spatial distance is understood to represent the physical distance aspect, social distance to represent the distance from the self. Hence, it is expected that considering something for oneself or one's own group relates to lower construal levels than if something is considered for someone else or an out-group individual. Applies to investing, this means that sustainability concerns would weigh more when the investment is considered for someone else than for oneself. Although this might appear a rather fictional situation, many financial decisions and investments alike are not (only) made for oneself, but for e.g. family members or an investing club. Congruently with the other dimensions, it is hypothesised that:

*H3: Social psychological distance affects preferences for sustainable investments. The more social distance, the more likely one is to prefer a sustainable fund.*

Lastly, it is argued that an event is further away from one's direct experience when it could have happened, but has not happened, when it is possible, but not certain, or when it is hypothetical instead of real (Trope & Liberman, 2010). This is called hypothetical psychological distance. An event that is improbable to happen thus seems more distant than an event that is probable to happen. Wakslak et al. (2006b) propose that decreasing an event's probability leads individuals to form a high-level construal. Unlikely outcomes might seem more remote and are hence construed at a relatively high level (Todorov et al., 2007). The explanation given by Wakslak and Trope (2009) is that individuals often have limited information about the specific unlikely events. It is then useful to focus on abstract features that are unlikely to change with additional, concrete information. Improbability is thus related to more psychological distance and a higher mental construal level (Trope et al., 2007; Wakslak & Trope, 2009). Hypotheticality and thus hypothetical distance is introduced to many financial decisions: often, uncertainty about lifecycles or expected turnover apply. For investing specifically, this would mean that sustainability as a primary feature, more salient at higher level construals, would be more important to preferences expressed about less likely investments. It is again hypothesised that:

*H4: Hypothetical psychological distance affects preferences for sustainable investments. The more hypothetical distance, the more likely one is to prefer a sustainable fund.*



### 3 Method

The hypotheses of this study are tested with a survey experiment. Figure 2 shows the theorised relationship, with both the factors of the causal chain that are observed in the experiment and those that are not. The subsequent session explains the rationale behind the employed method. The study was preregistered at Open Science Foundation on 13 November 2020 before creation of the data, see <https://osf.io/sqnez/>.

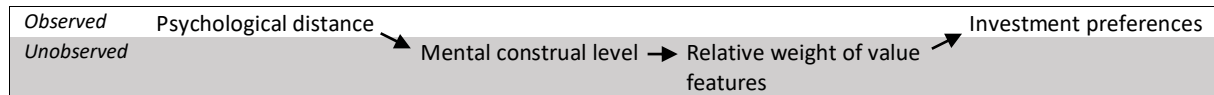


Figure 2: observed and unobserved factors of the causal chain

#### 3.1 Participants

Participants (N=601) were recruited from the Consumer Monitor of the Dutch financial conduct regulator, the Authority for the Financial Markets (AFM). The Consumer Monitor, operated by Ipsos, was set out among a representative sample of Dutch private investors. Fieldwork ran from 20 November to 1 December 2020. Appendix A reports extensively on the background characteristics of the participants. 53.7% of the participants was male, 46.3% was female. Most of them, 46.4%, were 55+ years old, 21.3% was 18-34, 14.6% was 35-44, and 17.6% was 45-54 years old. Participants were mixed in their highest level of completed education, which was low for 27.3% of them, mid for 41.1% and high for 31.6%. 27.8% of the participants earned less than modal income, 17.5% modal, and 39.6% above modal (15.1% did not answer this question). The participants had mixed experience with private investing: 49.8% has 10 years or more of experience. 1.3% has less than a year of experience, 21.1% has 1 to 3 years of experience, 8.7% 3 to 5 years of experience, 11.6% 5 to 10 years.

#### 3.2 Experimental design

The experimental design was inspired by the experiment (study 2) of Fujita et al. (2008) on desirability versus feasibility features for the evaluation of a DVD player sale. In that study, participants were asked to imagine finding a DVD player sale in the near future (low psychological distance) or distant future (high psychological distance). They were then shown one DVD sale option with seven positive features of the DVD player. Six features were identical for all participants (e.g. high-quality digital sound system, two-year warranty). The seventh feature was a feasibility argument, expected to be construed at a low level (easy to use manual) for one group and a desirability argument, expected to be construed at a high level (made of environmentally-friendly materials) for the other group. Participants were then asked to evaluate the presented sale from bad product to good product on a seven-point scale.

This design is fit for testing the relative weight of value features for investment preferences. As with a DVD players, investors are in reality also shown several features, such as a risk index, past performance, fund composition, and target markets. In the current experiment participants compared two products (investment funds) instead of evaluating only one. In a real-life investment choice setting, investors are namely unlikely to 'bump into' a fund, and then decide whether to invest or not, as could potentially happen with a DVD player sale. Rather, they consider investing and compare several options. It is assumed that even when they would be asked to evaluate only one fund, participants would compare the shown fund to a reference fund one has in mind. A second 'control' fund was therefore added to the design. This control fund functioned to control for the reference fund for all

participants and to increase the experiment's realism. A robustness check on unintended effects of the control fund on the outcome variable is presented in section 3.7.

In each distance domain, the experimental conditions were a combination two factors: a distance manipulation (distant or nearby) and a fund manipulation (value or feasibility). The four 2x2 between-subjects experiments had the following set-up. Participants were asked to imagine finding two funds online in either a near or distant condition. They were then shown two funds: a treatment fund (either the value or the practicality condition) and one of the control funds. For the value and practicality condition, three listed features were identical and the first listed feature differed. For matters of realism, the control funds mentioned slightly different information on the same assets. After being shown the two funds, participants were asked how they would allocate €10.000 over the two funds. They lastly filled out a manipulation check of perceived distance. Each participant completed this experimental task twice. In the second round, participants additionally answered three manipulation check questions on perceived sustainability, risk, and return. These manipulation checks are set out in the *Measures* paragraph. Appendix C shows the survey as presented to participants.

### 3.3 Randomisation and experimental conditions

Figure 3 shows the randomisation scheme. The distance dimensions were allocated randomly in such a way that participants were allocated to one of the three remaining dimensions after completing the first round. Each participant was allocated to the fund conditions (value or practicality) once, in random order. Participants also got allocated to one of the two control funds once in random order. The fact that participants would never see a fund option twice prevented anchoring and learning effects. Each participant was randomly assigned to the distance condition (nearby or distant). The four experimental groups per dimension (value-distant; value-nearby; practicality-distant; practicality-nearby) each have a number of 64 to 89 observations in total after two rounds. No round effects were found (see the correlation tables in appendix B), both for the separate dimensions as for the general analysis.

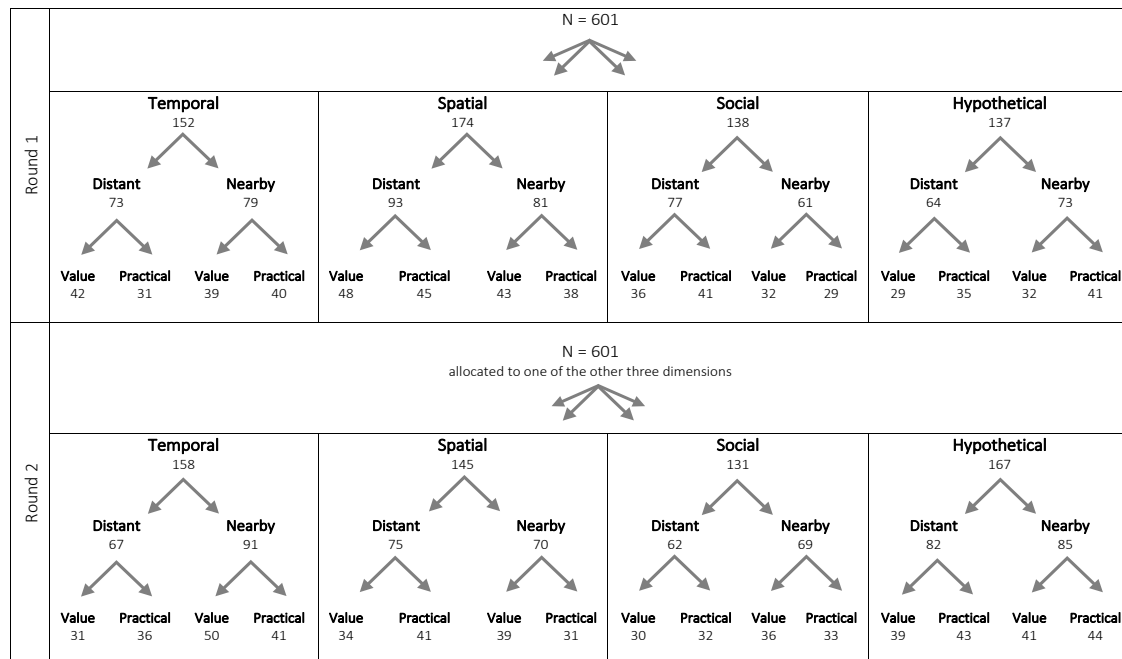


Figure 3: randomisation to the experimental conditions

### 3.4 Fund manipulation: value or practicality

Figure 4 shows the four funds used for the fund manipulation. The three listed identical features for both fund conditions were: an average return over the last three years of 3.40%, a risk score of five out of seven, and a fund size of €1.2 billion. The additional, first listed feature in the value condition stressed sustainability ('invests in sustainable firms'). The additional, first listed feature in the practicality condition stressed ease ('fund development easily trackable online'). Using different fund names increased realism.

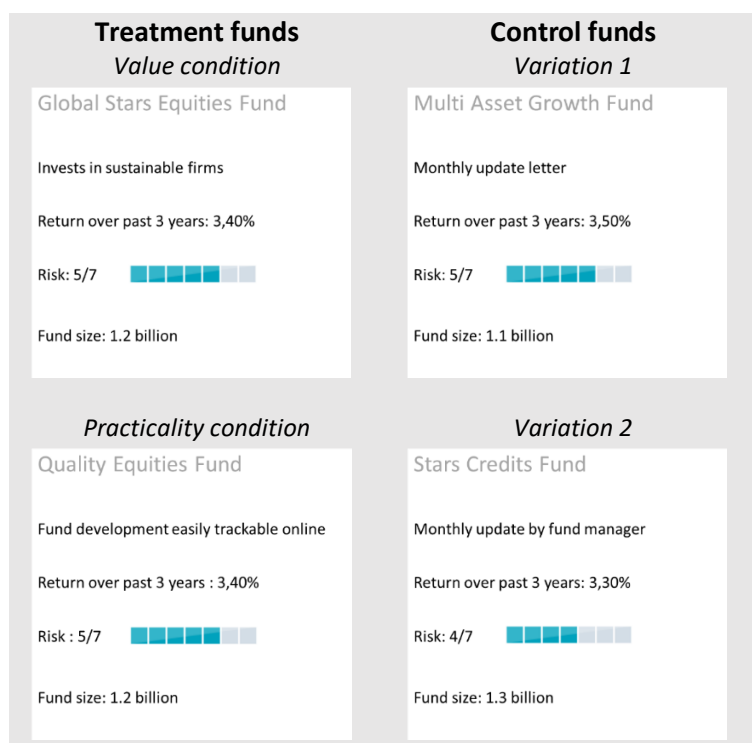


Figure 4: the treatment and control funds

### 3.5 Manipulation of psychological distance

Table 1 shows the instructions that manipulated psychological distance in English, the original instructions were in Dutch, the native language of most of the participants. As it is assumed that the four dimensions are distinct from each other (Trope & Liberman, 2010), the exact manipulation differed per dimension, as explicated below.

**Temporal distance** In the study of Fujita et al. (2008), participants were asked to imagine finding a DVD player sale on the Internet either this week (near future, low psychological distance condition) or three months from now (distant future, high psychological distance condition). This study adjusts the manipulations, by choosing a relevant time frame for an investment context marked by a longer-term process. Participants were asked to imagine that they want to invest within a month (near) versus within a year (distant).

**Spatial distance** Manipulations of spatial distance are for example having participants imagine that they are going on a trip to a nearby versus distant location (Chou & Lien, 2012), having participants describe a video made at a near or distant location (Fujita et al., 2006), having participants judge spatial

near or distant objects (Bar-Anan et al., 2006), or having participants believe that they talk to or make judgements about others who are in a nearby or distant location (Kim et al., 2008). As this study concisely follows definitions of spatial and social distance, hence distinguishing the physical and identification-aspect of psychological distance, it explicitly does not mention persons in the spatial distance condition. The spatially near condition was that it is about a Dutch fund, the spatially distant condition is that it is about a Japanese fund. It thereby applies the manipulation by Fujita et al. (2006) and Bar-Anan et al. (2006): making a judgement about a spatially near or distant objects.

*Social distance* Manipulations of social distance in other studies use the I versus other-distinction or the in-group versus out-group distinction (Kim et al., 2008). For example, participants were asked to evaluate stories written by classmates (near) or strangers (distant) (Liviatan et al., 2006), or to evaluate objects that were ‘yours’ or ‘theirs’ (Bar-Anan et al., 2006). The I-other distinction is fit for this study, as investment decisions are sometimes made for oneself but can be made for another person, too. The pronoun manipulation of Bar-Anan et al. (2006) was used: participants were asked to imagine finding a fund for him- or herself (near) versus for another investor (distant).

*Hypotheticality distance* Employed manipulations of hypotheticality distance are having participants believe there is a high or low likelihood that they will complete a task later in the study (Wakslak et al., 2006b), telling participants that it is about a hypothetical versus real situation (Eastwick et al., 2011), or having participants make judgements about an event that has a high or low probability of occurring (Todorov et al., 2007). This study follows the latter option by asking participants to evaluate funds that will be brought onto the market (near) or might be (distant).

Psychological distance → Dimension ↓	Nearby	Distant
Temporal	Imagine that you want to invest <b>upcoming month</b> . Amongst others, you find the following funds online.	Imagine that you want to invest <b>in a year</b> . Amongst others, you find the following funds online.
Spatial	Imagine that you want to invest. Amongst others, you find the following funds that invest in <b>Dutch companies</b> online.	Imagine that you want to invest. Amongst others, you find the following funds that invest in <b>Japanese companies</b> online.
Social	Imagine that <b>you</b> want to invest. Amongst others, <b>you</b> find the following funds online.	Imagine that <b>another investor</b> wants to invest. Amongst others, <b>that person</b> find the following funds online.
Hypothetical	Imagine that you receive an email from your broker. The broker indicates that the following funds will be brought onto the market.	Imagine that you receive an email from your broker. The broker indicates that the following funds <b>might</b> be brought onto the market.

Table 1: manipulation of psychological distance

### 3.6 Measures

The experiment contained the following measures. Firstly, the dependent variable, *fund preference*, was measured by asking participants how they would allocate €10.000 over the two shown funds. This is a common way to measure investing preferences and diversification strategies in economic studies (e.g. Benartzi & Thaler, 2001; Wilcox, 2003; Fox et al., 2005).

Secondly, the study tested whether sustainability indeed appealed to values with a measure of *environmental attitude*. The intended ‘activation’ of sustainable values in the high distance conditions was namely only possible if participants indeed possess sustainable values. While Fujita et al. (2008) used Schwartz’ (1992) value measurement in a pre-test, this study measured sustainable values in the same experiment with a measure designed by Statistics Netherlands (2018). This measure asks participants to indicate how important they consider the environment in general on a five-point scale. This question was asked before the experimental tasks, with questions in between to prevent from steering or priming effects. Environmental attitude was sometimes used as a binomial variable: participants that filled out ‘important’ to ‘very important’ were labelled ‘pro-environmentalists’, participants that filled out ‘very unimportant’, ‘unimportant’, or ‘neutral’ were labelled ‘non-environmentalists’. As the effect was only expected for participants with sustainable values, the main analyses and balance checks only included pro-environmentalists (N=876 after two rounds, see the randomisation scheme of figure 3 for pro-environmental participants in appendix D). The manipulation checks as explained below were done for all participants (N=1202 after two rounds).

The study thirdly included a measure of *perceived distance* on a 10-point scale in both rounds as manipulation check (see 3.7). It followed the logic of the manipulation check of social distance of Bornemann and Homburg (2011), tied to the specific distance domains. They ask participants to what extent they agree on a statement that the study was about their own opinion regarding the product. For social distance, participants were thus asked to what regard they thought the investment would have impact on themselves. For temporal distance, participants were asked at which moment they imagined doing the investment. For spatial distance, it was asked how far away the participants thought the firms in which one would invest were located, also parallel to the manipulation check designed by Kim et al. (2008) who asked about how physically far-away others were perceived. For hypothetical distance, participants were asked how likely they assessed the actual release of the funds.

Lastly, the second round included 7-point scale measures of *perceived sustainability*, *perceived risk* and *perceived return* of the two funds as manipulation checks (see 3.7). These checks follow the approach of Bornemann and Homburg (2011), who varied a quality description of a product and then asked how product quality was perceived. Section 3.7 presents a robustness check based on these measures’ outcomes: it was tested whether the study succeeded at creating more or less the same risk and return profiles of the treatment and control funds, and if the sustainable fund was indeed perceived as more sustainable than the other funds. These questions were asked only in the second round to not prime participants with e.g. sustainability concerns when completing the second round.

### 3.7 Manipulation checks

Psychological distance was manipulated to be higher for the group manipulated with high psychological distance than in the group manipulated with low psychological distance. The manipulation checks (one-tailed t-tests) of perceived show that this was not the case in any of the four distance domains, as displayed in table 2. These results show again when ‘speeders’, participants that completed the experiment in less than 60 seconds, were excluded from the analysis (N=834). This means that indifferences in the manipulation cannot be explained by participants who did not receive the manipulation because they did not take enough time to read the instructions.

In addition, the experiment included manipulation checks of perceived sustainability, risk and return. Table 3 shows the mean scores for the treatment and control funds. As intended, the sustainable treatment fund was perceived more sustainable than the practical fund and the two control funds, and the two control funds were perceived equally sustainable.



Regarding perceived risk, the treatment funds and control fund 1 did not significantly differ from each other, as anticipated. Perceived return was not perceived differently for the treatment funds and control fund 1, as expected. Unintendedly, the practical treatment fund was perceived significantly more sustainable than the control funds, although a difference of 0.1 on a 7-point scale is considered minor. Also, control fund 2 was unintendedly perceived around 0.35 points less risky than control fund 1 and both treatment funds. This can be explained by the lower risk score (4 out of 7) than for the other funds (5 out of 7). Control fund 2 was unanticipatedly perceived to yield less return, even though the difference in the indicated past performance was only 0.1 % (3.30% instead of 3.40%).

Dimension	$M_{\text{perceived}}$ distance	$M_{\text{low}}$	$M_{\text{high}}$	Difference $\alpha = 0.05$	
				all participants	speeders excluded
<i>Temporal</i>	6.116	5.994	6.264	No $t=0.982$ , $df=307$ , $p=0.327$	No $t=0.823$ , $df=291$ , $p=0.411$
<i>Spatial</i>	6.987	6.762	7.190	No $t=1.754$ , $df=315$ , $p=0.080$	No $t=1.835$ , $df=299$ , $p=0.068$
<i>Social</i>	5.684	5.554	5.806	No $t=0.961$ , $df=253$ , $p=0.338$	No $t=0.660$ , $df=238$ , $p=0.510$
<i>Hypothetical</i>	5.500	5.479	5.519	No $t=-0.171$ , $df=301$ , $p=0.864$	No $t=-0.114$ , $df=285$ , $p=0.909$

Table 2: perceived distance on a 1 (near)-10 (distant) scale for both treatment groups

Perceived risk and return thus sometimes significantly differed, *depending* on the control fund presented. Robustness checks (t-tests) were therefore run for the participants included in the main analysis. These checks tested whether the presented control fund mattered for our outcome variable of interest: the allocation to the treatment fund. Was there a difference in allocation, depending on which of the two control funds was presented? This was not the case in any of the four dimensions and in general ( $\alpha=0.025$ , two-tailed test):  $N=222$ ,  $t=0.748$ ,  $df=219$ ,  $p=0.455$  (temporal distance),  $N=237$ ,  $t=0.579$ ,  $df=231$ ,  $p=0.563$  (spatial distance),  $N=203$ ,  $t=0.651$ ,  $df=181$ ,  $p=0.516$  (social distance),  $N=214$ ,  $t=0.571$ ,  $df=209$ ,  $p=0.569$  (hypothetical distance), and  $N=879$ ,  $t=1.3458$ ,  $df=874$ ,  $p=0.179$  (general). The control fund was therefore not regarded a possible confounder of eventual differences in allocation over the funds and was not included in the main analysis models.

	Perceived sustainability	Perceived risk	Perceived return
$M_{t1}$ (sustainable fund)	4.983	4.733	4.217
$M_{t2}$ (practical fund)	3.950	4.721	4.219
$M_{c1}$ (control fund 1)	3.879	4.695	4.295
$M_{c2}$ (control fund 2)	3.780	4.389	4.088
Intended (in)differences $\alpha = 0.05$	$M_{t1} \neq M_{t2}$ $t=9.697$ , $df=584$ , $p<0.001$ $M_{t1} \neq M_{c1} = M_{c2}$ $t=-23.465$ , $df=600$ , $p<0.001$ $t=0.999$ , $df=591$ , $p=0.318$	$M_{t1} = M_{t2} = M_{c1}$ $t=0.137$ , $df=598$ , $p=0.891$ ; $t=0.707$ , $df=600$ , $p=0.480$	$M_{t1} = M_{t2} = M_{c1}$ $t=-0.030$ , $df=599$ , $p=0.976$ ; $t=-1.783$ , $df=600$ , $p=0.075$
Unintended differences $\alpha = 0.05$	$M_{t2} \neq M_{c1} = M_{c2}$ $t=-2.440$ , $df=600$ , $p=0.015$	$M_{c1} \neq M_{c2}$ $t=3.650$ , $df=590$ , $p<0.001$ $M_{t1} = M_{t2} \neq M_{c2}$ $t=7.468$ , $df=600$ , $p<0.001$	$M_{c1} \neq M_{c2}$ $t=2.363$ , $df=596$ , $p=0.018$ $M_{t1} = M_{t2} \neq M_{c2}$ $t=3.009$ , $df=600$ , $p=0.003$

Table 3: means for perceived sustainability, risk, and return on a 7-point scale ( $N=601$ )

### 3.8 Balance

Randomisation should in principle exclude confounders. Manipulated distance, the treatment fund and control fund were moreover balanced by the set-up of the design: each participant was

randomised to the other condition in the second round. The only unintended imbalance could exist for the background variables in the allocation to the four dimensions. Measures of background variables age, sex, education, investment experience, and household income were therefore included to carry out a balance check. The balance check included the participants included in the analyses, thus the pro-environmentalists. The balance check, of which appendix E shows the results, did not signal imbalances between the four dimensions. The differences in investment experience (0-60 years), total investment value (1-10) and total investable capital (1-7) did not differ significantly for the four groups.

### 3.9 *Power*

Based on the meta-analysis by Soderberg et al. (2015), an effect size (Cohen's  $d$ ) of 0.3 was expected. The sample size was +/- 50 and often somewhat higher. With  $\alpha=0.05$ , this results in a power ( $\beta$ ) of 0.71. See appendix F for the argumentation underlying the expected effect sizes.

## 4 Results

### 4.1 Main analyses

Before presenting the main results, it is important to outline that *interaction effects* between psychological distance and treatment fund were central to the main analyses. Each participant was exposed to two funds, a treatment fund – which could either be the sustainable or practical fund – and a control fund. Participants were then asked to allocate €10.000 between the treatment and control fund. We expect the effect of psychological distance to be observable when participants were shown the sustainable fund, but not when they were shown the practical fund as treatment fund. In other words, we expect psychological distance not to affect the allocation when participants were exposed to a fund stressing practicality and the control fund. However, participants exposed to the sustainable fund are expected to react differently when they perceive high psychological distance to the fund. Specifically, in the case of high psychological distance we expect them to allocate more money to the sustainable fund compared to a situation of low psychological distance.

Figure 5 provides a graph with this (expected and hypothetical) interaction. To confirm hypotheses 1-4 the analyses should show that the difference (low-high distance) is significantly larger for the sustainable fund (green dotted line) than it is for the practical fund (orange dotted line). That is the expected interaction effect indicated by black arrow in the figure.

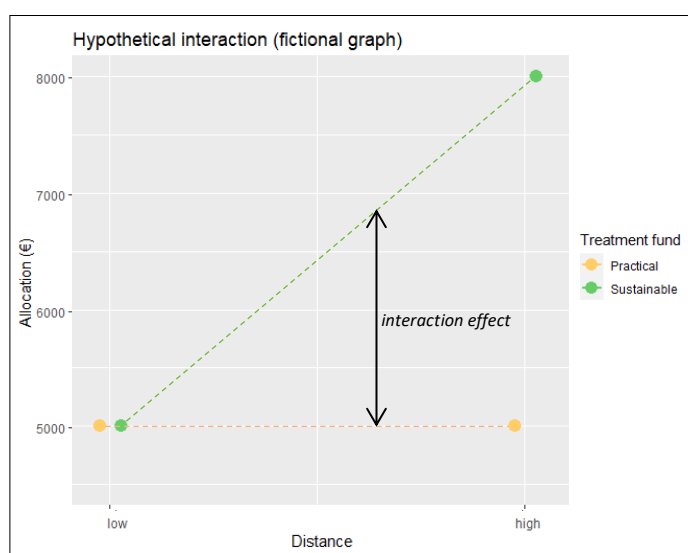


Figure 5: the hypothetical interaction

To test if the expected interaction indeed was observable in the data, first the main effects of treatment fund (sustainable or practical) and manipulated distance (high or low) were investigated with two-tailed t-tests. To test the hypotheses, however, it needed to be tested too whether the allocation to the sustainable fund depended on the manipulated distance. We were thus also looking for interaction effects. Linear regression analyses were carried out to test for interaction effects. Table 4 displays the average allocation for the fund sustainability (our moderator) and manipulated distance (our independent variable), as well as the test statistics of the main effects. The interactions are displayed per dimension in figure 6a-d. The test statistics of the interaction effects (one-tailed,  $\alpha=0.05$ ) are presented underneath each figure. The test statistics underlying the subsequent discussion of these results can be found in the table too. An additional analysis of the results for the four dimensions together is presented as well. Appendix B presents the correlation tables. Appendix G displays the average allocation over all funds.

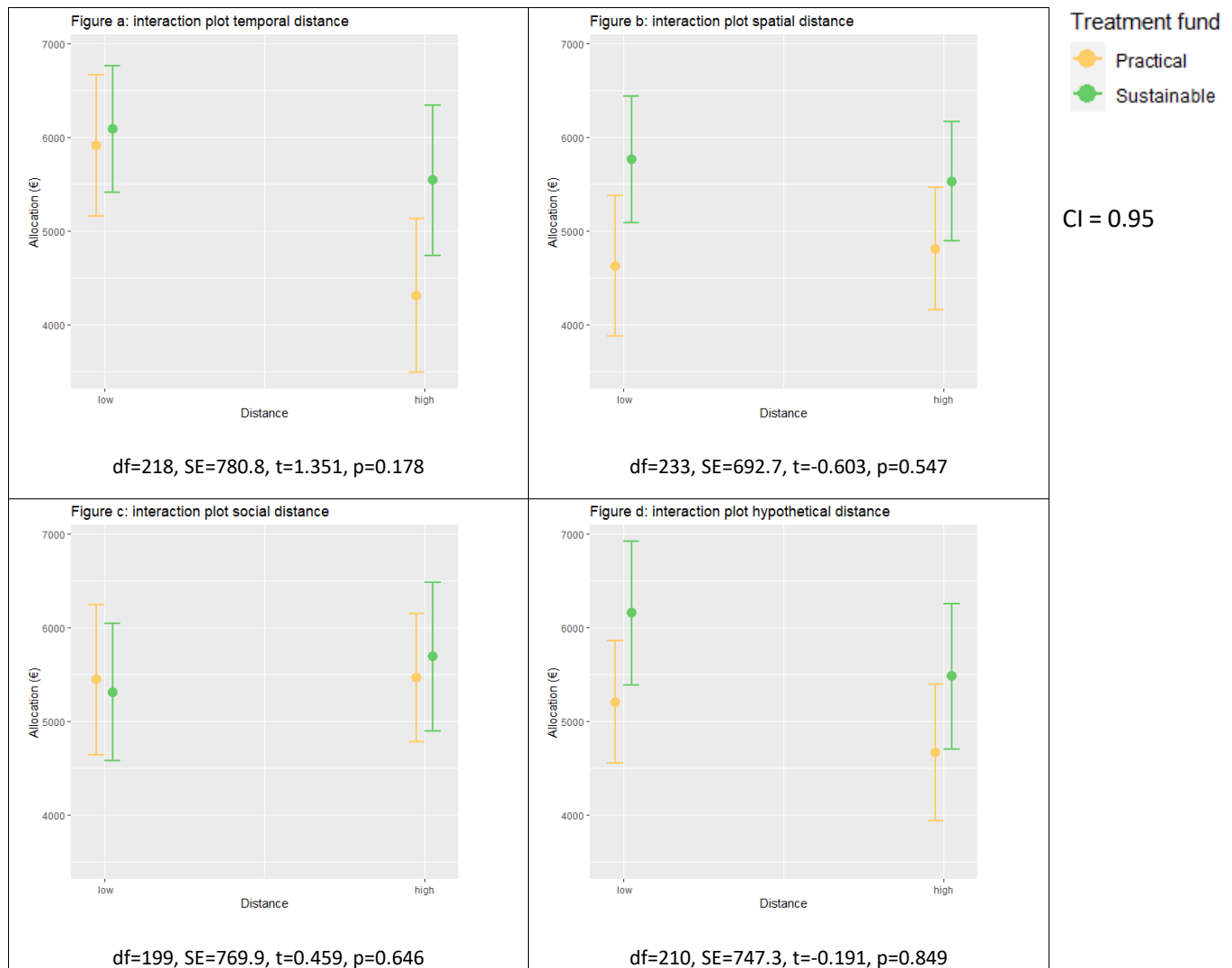


Figure 6: interaction plots for the four distance dimensions

For temporal distance first, participants in the near condition invest more in the treatment fund. This was not hypothesised: the theory does not offer an explanation for this effect. The sustainability of the treatment fund has no main effect. No significant interaction effect is found ( $p=0.178$ ), indicating that the effect of manipulated distance does not depend on which treatment fund was shown. Hypothesis 1, *temporal psychological distance affects preferences for sustainable investments. The more psychological distance, the more likely one is to prefer a sustainable fund*, is thus rejected, and the null hypothesis is corroborated. However, an additional t-test shows that the difference for the high and low distance condition is indeed significant: in the near condition, €1600 more is invested in the practical fund than in the distant condition ( $t=2.777$ ,  $df=100$ ,  $p=0.007$ , two-tailed). This is remarkable: this effect has the opposite direction of the expected effect. This effect is unanticipated for by psychological distance theory.

For spatial distance, the analysis shows a significant main effect of the treatment fund: participants shown the sustainable fund on average allocate €909 more to the treatment fund than participants shown the practical fund. Again, no interaction effect is found ( $p=0.547$ ). The effect of manipulated spatial distance thus does not depend on which treatment fund is shown. For this dimension too, the null hypothesis is corroborated and hypothesis 2, *spatial psychological distance affects preferences for sustainable investments. The more psychological distance, the more likely one is to prefer a sustainable fund*, is rejected.

Social distance is the only dimension for which the interaction plot (figure 6c) does suggest the expected effect: that the allocation to the sustainable fund would be higher in the distant condition than in the near condition, but that the allocation to the practical fund was invariant for the distance condition. The interaction regressions show that these differences are insignificant. No significant main effects are found. The interaction effect is not significant either ( $p=0.646$ ). The effect of manipulated social distance does again not depend on whether participants are shown the sustainable or practical fund. The null hypothesis is corroborated and hypothesis 3, *social psychological distance affects preferences for sustainable investments. The more psychological distance, the more likely one is to prefer a sustainable fund* is rejected.

Analyses for hypothetical distance, lastly, show similar results. The treatment fund matters significantly. However, no interaction effect is found ( $p=0.849$ ), indicating that the effect of hypothetical psychological distance on the allocation does not depend on the shown treatment fund. These results again corroborate the null hypothesis and hypothesis 4, *hypothetical psychological distance affects preferences for sustainable investments. The more psychological distance, the more likely one is to prefer a sustainable fund*, is rejected.

Dimension	Main effects two-tailed, $\alpha = 0.025$			
	Fund sustainability		Manipulated distance	
	Sustainable fund	Practical fund	Near	Distant
Temporal	€5861	€5181	€6008	€4939
	$t=1.724$ , $df=210$ , $p=0.086$		$t=-2.722$ , $df=202$ , $p=0.007^*$	
Spatial	€5639	€4730	€5252	€5181
	$t=2.651$ , $df=232$ , $p=0.009^*$		$t=-0.203$ , $df=217$ , $p=0.839$	
Social	€5485	€5457	€5371	€5561
	$t=0.073$ , $df=200$ , $p=0.942$		$t=0.500$ , $df=199$ , $p=0.618$	
Hypothetical	€5821	€4966	€5605	€5050
	$t=2.300$ , $df=204$ , $p=0.022^*$		$t=-1.479$ , $df=206$ , $p=0.141$	
General	€5704	€5074	€5583	€5190
	$t=3.397$ , $df=873$ , $p<0.001^*$		$t=-2.113$ , $df=874$ , $p=0.035$	
	* $M_{\text{sustainable}} > M_{\text{practical}}$		* $M_{\text{near}} > M_{\text{distant}}$	

Table 4: main effects of fund sustainability and manipulated distance on the allocation (for two rounds, for pro-environmentalists)

#### 4.2 Exploratory analysis: effects of distance in general

Following the literature (Bar-Anan et al., 2007; Liberman et al., 2007; Trope & Liberman, 2010, 2014), the four distance dimensions are all part of the same construct, that is psychological distance. The main analysis was therefore repeated for the four dimensions together. The results of this exploratory analysis are in line with the analyses per dimension as presented above. Over all dimensions, the treatment fund has an effect on the allocated amount: pro-environmental participants shown the practical fund on average allocate €630 less in this fund than the participants showed the sustainable fund did (as was also true for the separate dimensions of spatial and hypothetical distance). The main effect of manipulated distance is insignificant ( $p=0.035$  does not meet the 0.025 requirement of a two-tailed test). The interaction, as figure 7 displays, has an insignificant effect. For the dimensions overall, the analyses do not support the expectation that psychological distance increases the choice for sustainable investments.



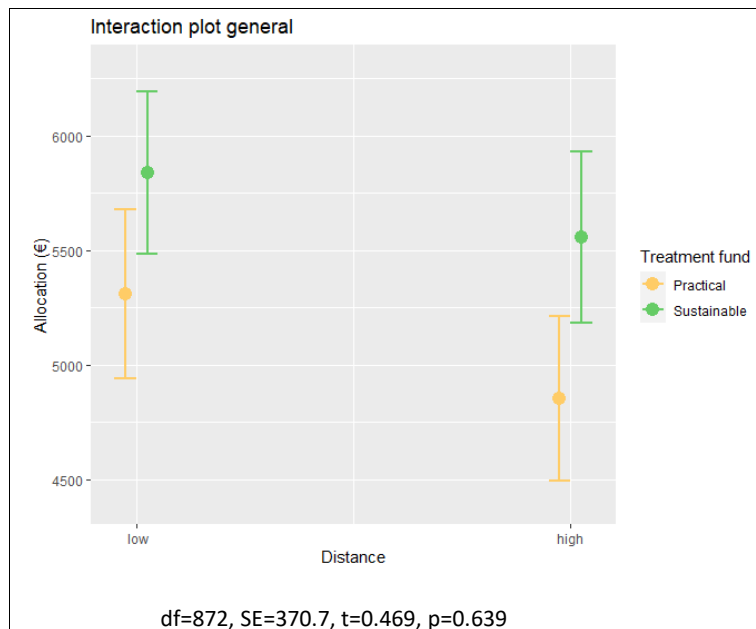


Figure 7: interaction plot of four dimensions together (general)

#### 4.3 Exploratory analysis: pro-environmentalists

We learned that a pro-environmental attitude has a considerable effect on investment preferences. Those with a pro-environmental attitude on average allocated €1076 more in the sustainable fund than those with a non/neutral-environmental attitude did ( $t=4.318$ ,  $df=288$ ,  $p<0.001$ ). There were thus large differences in how much participants invested in the sustainable fund, depending on their environmental attitude.

Who were the pro-environmentalists of this study? Overall, participants show considerably high environmental attitude: to the question to indicate how important they deemed the environment in general, only 5.2% answers (very) unimportant. 22% was neutral and 72.8% answers (very) important, of which 16.1% even says very important. Compared to the Statistics Netherlands data on the same question gathered in 2017, this sample has a somewhat lower rate of environmental concern: in the Statistics Netherlands survey, 90% of participants answered that they thought the environment was (very) important and only 1% expressed that they thought the environment was unimportant. The 'neutral' group of this experiment (22%) was larger than for the Statistics Netherlands results (9%).

Females had a somewhat (0.132 on a 1-5 scale) higher environmental attitude than male ( $t=2.772$ ,  $df=277$ ,  $p=0.006$ , two-tailed). Completed education (see table 1 in appendix H) did matter: high educated participants had a slightly higher environmental attitude, on average 3.947, than low-educated participants (mean of 3.707,  $t=4.388$ ,  $df=189$ ,  $p<0.001$ , two-tailed) and middle-educated participants (mean of 3.765,  $t=3.330$ ,  $df=189$ ,  $p=0.001$ , two-tailed). Middle- and low-educated participants did not differ significantly in their average environmental attitude ( $p=0.0295$ , two-tailed). The current investment value did nearly reach the required significance level ( $p=0.026$ , two-tailed): pro-environmentalists had an investment value of 3.783, others of 3.245 on average (1-10 scale). Interestingly, the total value of invested and investable capital did differ ( $p=0.0146$ , two-tailed): pro-environmentalists had an average of 3.402, others of 2.963. Pro-environmentalist thus have a higher amount available for possible investments.

Income did not matter for environmental attitude ( $\beta=0.004$ ,  $sd=0.018$ ,  $p=0.785$ , two-tailed). The pro-environmentalists and non-environmentalists did moreover not differ in their average income ( $p=0.477$ , two-tailed). The pro- and non-to-neutral-environmentalists did also not differ in investment experience ( $p=0.364$ , two-tailed), which was 12.72 years on average for the pro-environmentalists and 11.79 years for the others. Although the pro-environmentalists and non-environmentalists of this sample differed in risk preferences (see table 2 in appendix H), this difference was insignificant too ( $df=2$ ,  $p=0.407$ ).

#### 4.4 Results: a summary

The meaning of results for the hypotheses is displayed in table 5. For all dimensions as well as in general, no interaction effects were found: the effect of psychological distance on investment preferences did not depend on whether participants were shown the sustainable or the practical fund. Hypotheses 1-4 were therefore rejected. Psychological distance had a main effect on investment preferences for temporal distance: low distance-manipulated participants invest less in the treatment fund. Psychological distance theory does not provide an explanation for this effect. The sustainability of the fund had a significant effect on investment preferences in general: participants invested €630 more in the sustainable fund. Environmental attitude moreover matters for investment preferences: pro-environmentalists on average invested €1076 more in the sustainable fund than non-environmentalists.

Hypothesis	Status
H1: Temporal psychological distance affects preferences for sustainable investments. The more temporal distance, the more likely one is to prefer a sustainable fund.	Rejected
H2: Spatial psychological distance affects preferences for sustainable investments. The more spatial distance, the more likely one is to prefer a sustainable fund.	Rejected
H3: Social psychological distance affects preferences for sustainable investments. The more social distance, the more likely one is to prefer a sustainable fund.	Rejected
H4: Hypothetical psychological distance affects preferences for sustainable investments. The more hypothetical distance, the more likely one is to prefer a sustainable fund.	Rejected

Table 5: results for the hypotheses

## 5 Conclusion

This paper sought to answer the research question “*does psychological distance increase investor preferences for sustainable investments?*”, since psychological distance shows to affect the relative weight of our values for our behaviour. The question was answered with a survey experiment based on an experiment developed by Fujita et al. (2008). The current experiment randomly allocated participants over one of the two manipulation conditions of psychological distance, namely near or distant. Participants were then asked about their preferences by allocating €10.000 over two funds, of which one fund stressed either sustainability or feasibility, and the other fund functioned as a control fund. This experiment was done for the four dimensions of psychological distance that are theorised to have the similar underlying mechanism of psychological distance: temporal, spatial, social and hypothetical distance. The manipulations resembled in set-up and were made specific to the dimension.

The answer to the research question is that the experiment found no effect of psychological distance on sustainable investor preferences. The null hypothesis, that psychological distance does not affect sustainable investment preferences, was corroborated. This was found for the four dimensions of psychological distance as well as in general. This is not in line with psychological distance theory (Trope & Liberman, 2010). This theory argues that psychological distance affects the information we use to make decisions, because the weight of ‘primary features’ increases with psychological distance (Trope & Liberman, 2010; Ledgerwood et al., 2010b; Brügger, 2020). Values are conceptualised as a ‘primary feature’: they are abstract in essence, hence more applicable to distant situations and decisions (Eyal et al., 2009; Kivetz & Tyler, 2007; Danziger et al., 2012; Agerström & Björklund, 2009a; 2009b; 2012; Giacomantio et al., 2010). Sustainability, which appeals to values (Van Liere & Dunlap, 1981; Reczek et al., 2018), would thus be a more important argument when people experience more psychological distance to an investment. This study shows that this expectation does not hold.

The answer to the research question has three main implications. These are that individuals do actually succeed at translating values into preferences; that psychological distance theory does not generalise to financial and/or contextualised and complex decision-making; and that investors pick up some but neglect other information when they make investment decisions. These implications as well as suggestions for future research will be elaborated further on. First, the methodological issues that possibly underly the null effects are explored, namely the strength of the manipulation, possible confounders introduced by realism, and the power of the study.

### 5.1 Methodological discussion

A methodological explanation of the null effects is that participants did not receive the manipulation. Although the check for the manipulation of the treatment fund showed that differences in sustainability of the funds were noted, the manipulation of psychological distance might not be received as intended. The manipulation check of distance, which merely asked whether participants noted the sentence which was meant to manipulate the perceived distance, shows no significant difference in perceived distance between the manipulated low and high distance groups, for all four dimensions. This indicates that participants did not receive the manipulation. The manipulation was however based upon earlier studies that show robust effects (Soderberg et al., 2015). The instruction that contained the manipulation moreover stated the distance aspect clearly. The possible explanation that participants did not read the manipulation at all is evaluated unlikely. There was namely no difference found between ‘speeders’ and other participants, indicating that time spent on the

experiment did not matter for how well the manipulation was received. Therefore, the results of the manipulation check are interpreted as a reflection of the balance between realism and internal validity this experiment sought to establish. In more controlled settings, the chosen manipulation might have come across stronger. However, with the introduction of realism by imitating a real-life investment setting, the manipulation of the independent variable “is more likely to ‘mirror’ that in real life” (Posdakoff & Posdakoff, 2019: 17). This design choice might lead to the conclusion that the manipulations that show established effects in lab experiments (Soderberg et al., 2015) are not as effective in realistic experiment settings.

Moreover, it could be argued that the strategy to increase realism of the experiment, namely by altering fund names and making minor changes in fund characteristics other than the manipulated asset, led to confounders in the results. This is however considered unlikely. The robustness check showed that, although participants noted the minor differences in perceived risk and return, this perception had no effect on the outcome variable.

A possibly limited reception of the manipulation does challenge the power of the study. The expected power of 0.71 was based upon an effect size of 0.3 that was found in the meta-analysis of Soderberg et al. (2015). The manipulation check results suggest that the manipulation might not have come across as strong as in controlled settings, hence might have a limited effect. With an effect size of, for example, 0.2 or 0.1 instead of 0.3, the power decreases to 0.41 or 0.17 respectively. However, the analyses for the four dimensions together did also not show effects despite the four times larger sample size than for the separate dimensions. With an effect size of 0.2, the power would still be 0.89. This indicates that the null effects cannot be attributed to limited power.

## 5.2 *Implications for public administration scholars, for psychologists, and for practitioners*

Next to these methodological explanations of the null effects, it is also well possible that there is no true effect. The results have three main implications: one for public administration scholars, one for psychologists, and one for practitioners.

For public administration scholars, firstly, this study indicates that sustainable citizen behaviour should be taken seriously for studying effective responses to the climate crisis. A discrepancy between values and behaviour, or a so-called value-action gap (Blake, 1999), was expected to be observable when studying the decision-making step from values into preferences. However, this study did not find such a gap. It namely found that individuals do actually succeed at translating sustainable values into sustainable preferences. There was a considerable difference in allocation to the sustainable fund between pro-environmental and non-to-neutral-environmental attituded participants. Pro-environmental participants thus translated their sustainable values into their preferences where others did not, as they did not possess these values. Although further research (elaborated on in the next paragraph) should disclose whether citizens are also able to eventually translate their values into behaviour, this study does not find support for the assumed inability of citizens to act on their values.

This implication runs counter the focus of the scarce number of public administration studies that have investigated sustainable citizen behaviour. These studies emphasize that citizens do not act on their sustainable values (Milfont, 2010; Gifford, 2011; Moser & Dilling, 2011; Whitmarsh et al., 2011; Frederiks et al., 2015; Hughes et al., 2018; Rinscheid et al., 2020). The notion of a value-action gap dominates both the academic and the policymaking perspective (e.g. WRR, 2017; Ministry of Economic Affairs and Climate Policy, 2019) on sustainable citizen behaviour. This study however suggests that

the dominant image of citizens that are unable of sustainable action does not do justice to the actual sustainable potential of citizen behaviour.

The suggestion that citizens are well capable of sustainable behaviour can be understood as a plea for more attention to sustainable citizen behaviour. So far, with some exceptions (e.g. Frederiks et al., 2015; Dessart et al., 2019), the discipline of public administration has been relatively inattentive to sustainable citizen behaviour. Yet, citizens are an important actor for successfully realising climate policies (Levin et al., 2007). The climate crisis demands an integrative approach: action on all levels is needed (Jordan et al., 2010). Public administration is the discipline par excellence to traverse these levels, from the societal to the individual. The potential of sustainable behaviour as implied by this study stresses the importance for public administration of being attentive to this citizen-level potential for navigating the climate crisis.

For psychologists, secondly, this study has proven insights into the boundary conditions of psychological distance theory. As many psychological theories, psychological distance theory too has mostly been tested in controlled settings and with student samples (Soderberg et al., 2015). This study chose to apply the theory to a contextualised and realistic setting. While the theory is of explanatory value for decontextualised lab-settings, it might not be for more contextualised settings. If the absence of effects are true to the population, this study showed that psychological distance in the form of subtle yet realistic cues do not effect realistic choice settings.

Specifically, the current study indicates that the complexity of financial decision-making forms a boundary condition for psychological distance theory. Financial decisions, such as evaluating an investment fund, follows other 'rules' than evaluating a DVD-player, which was the task in the experiment by Fujita et al. (2008) this study was based on. The uniqueness of the financial choice process is illustrated by the outcomes for the dependent variable. The allocation of €10.000 over two funds centred around €5000 per fund, hence overall variation was rather small. Participants might have the tendency to spread risks by dividing capital over funds. 'Diversification' is even one of the advised rules of thumb for investing (e.g. Benartzi & Thaler, 2001; Statman, 2004). Such a tendency might diminish the effect of sustainability concerns as driver for investment decisions. While values as primary feature can dominate 'simple' decisions, such as evaluating a DVD-player, the complexity of financial decisions decreases the effect of primary and secondary features as suggested by psychological distance theory. The suggestion that psychological distance theory does not generalise to contextualised settings and complex decision-making processes shows that the discipline of Behavioural Public Administration is not a one-way street. Instead, as Grimmelikhuijsen et al. (2017) suggest, testing psychological theories in realistic settings that characterise public administration studies also develops the field of psychology. Not all psychological theories might hold in a public sector context.

Thirdly, the study holds important implications for practitioners. Not only has this study given insight in the profile of pro-environmental citizens, it also teaches us about what information investors use for their considerations. While cues in a written sentence had no effect on the participants, participants did note relatively small differences in expected risk and return that were shown in the overview in the textbox format. This was stressed by the results of the manipulation checks: even differences of 0.10% return were picked up by participants. This insight firstly shows that information deemed important to made considerate decisions should be presented in the easy-view textbox format, and in any case not in wordy instructions. Secondly, it gives insight into the vulnerabilities of citizen behaviour and thus possible areas of exploitation of this behaviour. This knowledge assists supervisors like the Dutch Authority for the Financial Markets in their search on how to protect consumers from greenwashing practices (Authority for the Financial Markets, 2020). Although

supervisors should stay attentive to cognitive boundaries, this study does not indicate that psychological distance forms a considerable risk for subtle consumer exploitation. The experiment namely shows that subtle cues that should affect psychological distance do not affect citizen preferences. It does show however that citizens are mostly sensitive to information in the easy-view format. Exploitation of citizen behaviour is thus most likely to happen in the easy-view formats in the choice environment. With these insights for policymaking, this study hopes contribute to navigating the climate crisis.

### 5.3 Pathways for future research

The current study has given insights into several interesting pathways for future studies. Firstly, it might be worthwhile to explore the effect of psychological distance on actual investing *behaviour*. The interpretation of the current findings, that individuals are not hindered in translating their *values* into *preferences*, does not exclude such a mechanism for the step thereafter, namely translating *preferences* into *behaviour*. Studying this step is interesting, especially in the light of the assumption that sustainable behaviour too is hindered by a value-action gap (e.g. Moser & Dilling, 2011; Hughes et al., 2018; Rinscheid et al., 2020). Moreover, the variance of findings into the drivers of sustainable investing (Puaschunder, 2011; Riedl & Smeets, 2017; Døskeland & Pedersen, 2016; 2019; Jansson & Biel, 2011; Gutsche et al., 2016) suggests that investment decision-making is inconsistent, thus indeed bounded. Given the robustness of psychological distance effects in other domains (Soderberg et al., 2015) and some indications that psychological distance matters for financial decisions too (Bornemann & Homburg, 2011; Chang et al., 2015), it would be worthwhile to inspect this step in future research.

Secondly, it is worthwhile to further apply of psychological distance theory to public administration issues, in which this study pioneered, together with studies by Ritz et al. (2019) and Park et al. (2020). Public administration questions on a macro level namely involve assumptions about the micro level: individual behaviour (Jilke, 2015). We identify a few areas for which psychological distance might be of explanatory value. To recall, several considerations become more important at higher psychological distance. For example, the weight of pro's rather than con's (Eyal et al., 2004), desirability rather than practical concerns (Liberman & Trope, 1998), goals rather than means (Danziger et al., 2012), or of course values rather than feasibility (Eyal et al., 2008) increases for distant events, evaluations and decisions. There are several public administration topics in which distance might be introduced, hence psychological distance might influence evaluations and decision-making. Firstly, policymakers often have to make decisions based upon uncertain facts. Uncertainty increases psychological distance on the hypothetical dimension: events that are uncertain to happen have higher hypothetical distance than events that are (Trope & Liberman, 2010). How does the increased hypothetical distance to events affect the decisions? Do policymakers for example focus more on high level goals when evidence is uncertain? Work by Trautmann and Van de Kuilen (2012) into psychological mechanisms of risky decisions might inspire such a study.

A third interesting outlook lies in the discipline of e-government or virtuality. Interaction between public officials and citizens, as well as interaction between public managers and employees, increasingly takes place virtually. This trend has been reinforced by the Covid-19 pandemic that has forced many of us to work from home. Virtuality increases spatial and sometimes temporal distance, hence impacts our perception of the characteristics of the virtual event (Wilson et al., 2013). It can be hypothesised that virtuality alters the perception of the interacting individuals. Hence, questions like the following arise: do citizens evaluate public services offered virtually differently than services offered in person? Do public managers focus more on the long-term goals than on daily practical

concerns when they work from home? Are public servants more attentive to primary arguments, like desirability or values, when they negotiate virtually?

Fourthly, psychological distance theory might be helpful in studying how power affects individual behaviour. Power has been argued to increase psychological distance one perceived from others, thus social distance, hence leads to more abstract information processing (Smith & Trope, 2006). This assumption has not been studied widely, but has been corroborated by Magee et al. (2010) in their text analysis of reactions to the 9/11 events. The effect of psychological distance, moderated by the possession or perception of power, could offer interesting insights into behaviour of citizens, officials, managers and politicians. Moreover, testing the assumption made by Smith and Trope (2006) in a realistic experiment could further advance psychological distance theory. All in all, psychological distance theory offers valuable outlooks on public administration topics that include an element of individual behaviour.

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## Appendix A: background characteristics of participants

Variable	N	Categories	Part in total
Environmental attitude	601		
Age	601	18-34 35-44 45-54 55+ years old	21.3% 14.6% 17.6% 46.4%
Sex	601	Male Female	53.7% 46.3%
Highest completed education	601	Low Mid High	27.3% 41.1% 31.6%
Risk type	601	Cautious Neutral Risk-seeking	22.1% 60.4% 17.5%
Family situation	601	Single, younger than 35 Single, 35 or older Family of two or more persons Family with a 0-12 year old child Family with a 13-17 year old child	6.7% 17.5% 54.2% 16.3% 5.2%
Household income, cat	601	Below modal Modal Above modal Unknown	27.8% 17.5% 39.6% 15.1%
Device	601	PC Tablet Smartphone	61.4% 10.1% 28.5%
Investment experience, categories	556	Less than a year 1 to 3 years 3 to 5 years 5 to 10 years More than 10 years	1.3% 21.1% 8.7% 11.6% 49.8%
Variable	N	Mean (standard error)	Range
Household income	601	4.802 (1.959)	1-8 scale
Investment value	601	3.637 (2.717)	1-10 scale
Total investable capital	601	3.283 (1.993)	1-7 scale
Investment experience	556	12.46 (10.730)	0-60 years
Time spent on the experiment	601	217.38 (342.461)	21-6714 seconds



## Appendix B: correlation tables

This appendix presents the correlation tables of the regression analyse (main analysis, see *Results* section). To check whether randomisation had succeeded, control variables were added to the regression analyses one by one and dropped if they had an insignificant effect. For all four dimensions as well as for results of the four dimensions together, the background characteristics age, sex, education, household income and investment experience had no significant effect on the allocated amount in the treatment fund. Although the effect of household income does not meet the required significance level of 0.025 for a two-tailed test ( $p=0.038$  for spatial distance and 0.042 for social distance), an extra test was carried out to see if the effect of the treatment fund depended on household income. This was not the case, as can be seen in the correlation tables for the separate dimensions (table 1-4) and the four dimensions together (table 5).

	Model I: main effects	Model II: interaction effects							
Intercept	4842.8*** (875.0)	7281.3*** (2004.7)							
Treatment fund	-634.4 (387.9)	-2285.4 (1281.6)							
Distance	1040.8** (390.4)	-510.3 (1212.1)							
Treatment fund * Distance		1055.2 (780.8)							
Round			32.8 (388.9)						
Time				0.1071 (0.4120)					
Education					18.75 (263.64)				
Age						-79.28 (157.86)			
Sex							-402.4 (386.8)		
Household income								46.46 (97.06)	
Experience									-14.67 (19.53)
N=222									
Significance levels: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1									

Table 1: correlation table, temporal dimension

	Model I: main effects	Model II: interaction effects							
Intercept	6489.58*** (744.05)	5600.0*** (1653.8)							
Treatment fund	-907.78** (344.07)	-303.0 (1061.2)							
Distance	38.88 (345.00)	650.2 (1071.8)							
Treatment fund * Distance		-417.4 (692.7)							
Round			-63.24 (346.65)						
Time				-0.3827 (0.3304)					
Education					-130.4 (221.7)				
Age						82.64 (139.66)			
Sex							141.9 (348.7)		
Household income								-184.71* (p=0.038) (88.34)	
Experience									-15.59 (17.17)
N=237									
Significance levels: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1									

Table 2: correlation table, spatial dimension

	Model I: main effects	Model II: interaction effects							
Intercept	5839.26*** (882.24)	6642.6*** (1959.1)							
Treatment fund	-51.59 (383.94)	-575.7 (1203.7)							
Distance	-196.57 (384.09)	-731.5 (1226.3)							
Treatment fund * Distance		353.8 (769.9)							
Round			-150.6 (383.4)						
Time				0.5851 (1.1657)					
Education					101.6 (241.3)				
Age						-171.0 (159.3)			
Sex							428.1 (390.2)		
Household income								-197.02* (p=0.042) (96.18)	
Experience									-15.29 (19.32)
N=203									
Significance levels: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1									

Table 3: correlation table, social dimension

	Model I: main effects	Model II: interaction effects							
Intercept	5804.3*** (812.5)	5467.3** (1942.5)							
Treatment fund	-884.2* (372.2)	-666.1 (1200.8)							
Distance	598.5 (370.7)	820.3 (1218.7)							
Treatment fund * Distance		-142.8 (747.3)							
Round			-366.3 (376.0)						
Time				0.2689 (0.6970)					
Education					165.3 (246.9)				
Age						-36.27 (157.44)			
Sex							-55.12 (375.28)		
Household income								74.18 (94.27)	
Experience									-12.61 (17.38)
N=214									
Significance levels: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1									

Table 4: correlation table, hypothetical dimension

	Model I: main effects	Model II: interaction effects							
Intercept	5755.3*** (411.5)	6149.7*** ( 936.8)							
Treatment fund	-616.4*** ( 185.2)	-878.2 (588.5)							
Distance	370.7* (185.3)	110.1 ( 586.3)							
Treatment fund * Distance		173.7 (370.7)							
Round			-130.1 (185.6)						
Time				-0.09065 (0.23618)					
Education					27.64 (120.68)				
Age						-42.96 (76.16)			
Sex							64.78 (185.71)		
Household income								-54.03 (46.94)	
Experience									- 13.865 (9.093)
N = 876									
Significance levels: '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1									

Table 1: correlation table, general (four dimensions together)

## Appendix C: survey, example for the condition spatial-high distance



Kunt u aangeven hoe onbelangrijk of belangrijk u het milieu in het algemeen vindt?

- ☐ Heel onbelangrijk
- ☐ Onbelangrijk
- ☐ Niet onbelangrijk, niet belangrijk
- ☐ Belangrijk
- ☐ Heel belangrijk

Vorige

Volgende

[other questions that were part of the survey were asked in between]

[Experiment task as presented below was completed twice]



We willen u vragen een investering in beleggingsfondsen in te beelden. Nu volgt eerst een korte uitleg over de fondsen. Het is van belang dat u deze goed leest.

Denk in dat een andere belegger wil beleggen. Online vindt diegene onder andere de volgende fondsen.

Klik op de afbeelding om deze te vergroten.

Global Stars Equities Fund

Belegt in duurzame bedrijven

Rendement afgelopen 3 jaar: 3,40%

Risico: 5/7

Fondsgrootte: 1,2 miljard

Stars Credits Fund

Maandelijke update door fondsmanager

Rendement afgelopen 3 jaar: 3,30%

Risico: 4/7

Fondsgrootte: 1,3 miljard

Als deze andere belegger een investering van €10.000,- zou maken, hoe zou diegene dit volgens u het beste verdelen over deze twee fondsen?

Het is ook mogelijk om het volledige bedrag in één van de twee fondsen te investeren.

Linkerfonds

(Global Stars Equities Fund)

Rechterfonds

(Stars Credits Fund)

€

Vorige

Volgende

totaal: 0, over: 10000

[For the social distance dimension, the allocation question was “Als u een investering van €10.000,- zou maken, hoe zou u dit dan verdelen over deze twee fondsen?” (low distance) / “Als deze andere belegger een investering van €10.000,- zou maken, hoe zou diegene dit volgens u het beste verdelen over deze twee fondsen?” (high distance)]



Geef op een schaal van 1 t/m 10 aan in hoeverre u dacht dat deze investering in de denkbeeldige situatie een grote impact op uzelf zou hebben.

1 = zeer weinig impact op mijzelf – 10 = zeer veel impact op mijzelf

▼ 8

☐ 1

☐ 2

☐ 3

☐ 4

☐ 5

☐ 6

☐ 7

☒ 8

☐ 9

☐ 10

Vorige

Volgende

[the three questions below only were asked for the funds shown in round 2)



Klik op de afbeelding om deze te vergroten.

Quality Equities Fund

Multi Asset Growth Fund

Fondsverloop eenvoudig online te volgen

Maandelijkse voortgangnieuwsbrief

Rendement afgelopen 3 jaar: 3,40%

Rendement afgelopen 3 jaar: 3,50%

Risico: 5/7

Risico: 5/7

Fondsgrootte: 1,2 miljard

Fondsgrootte: 1,1 miljard

Hoe risicovol acht u het investeren in het **linkerfonds** (Quality Equities Fund) ?



1 = geheel niet risicovol – 7 = zeer risicovol

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

Hoe risicovol acht u het investeren in het **rechterfonds** (Multi Asset Growth Fund) ?



1 = geheel niet risicovol – 7 = zeer risicovol

Vorige

Volgende



Klik op de afbeelding om deze te vergroten.

Quality Equities Fund	Multi Asset Growth Fund
Fondsverloop eenvoudig online te volgen	Maandelijke voortgangsnieuwsbrief
Rendement afgelopen 3 jaar: 3,40%	Rendement afgelopen 3 jaar: 3,50%
Risico: 5/7 	Risico: 5/7 
Fondsgrootte: 1,2 miljard	Fondsgrootte: 1,1 miljard

Hoeveel rendement denkt u dat het **linkerfonds (Quality Equities Fund)** oplevert?



1 = geen tot zeer weinig rendement – 7 = zeer veel rendement

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

Hoeveel rendement denkt u dat het **rechterfonds (Multi Asset Growth Fund)** oplevert?



1 = geen tot zeer weinig rendement – 7 = zeer veel rendement

Vorige

Volgende



Klik op de afbeelding om deze te vergroten.

Quality Equities Fund	Multi Asset Growth Fund
Fondsverloop eenvoudig online te volgen	Maandelijke voortgangsnieuwsbrief
Rendement afgelopen 3 jaar: 3,40%	Rendement afgelopen 3 jaar: 3,50%
Risico: 5/7 	Risico: 5/7 
Fondsgrootte: 1,2 miljard	Fondsgrootte: 1,1 miljard

Hoe duurzaam denkt u dat dit het **linkerfonds (Quality Equities Fund)** investeert?



1 = helemaal niet duurzaam – 7 = zeer duurzaam

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7

Hoe duurzaam denkt u dat dit **rechterfonds (Multi Asset Growth Fund)** investeert?



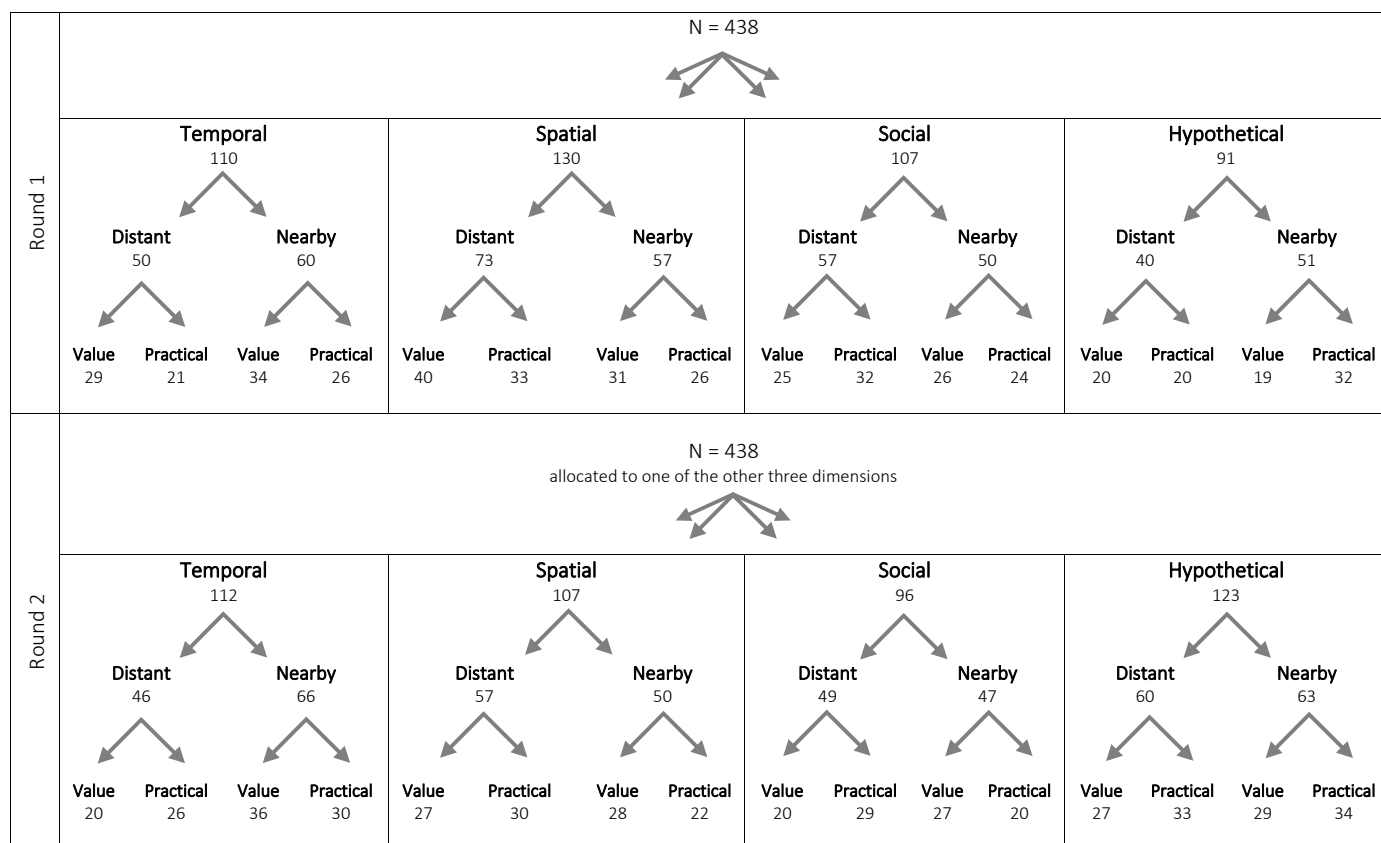
1 = helemaal niet duurzaam – 7 = zeer duurzaam

Vorige

Volgende



## Appendix D: randomisation scheme for pro-environmental participants



## Appendix E: balance check of the allocation of pro-environmental participants to distance dimensions

Control variable		Distance dimension			
	Levels/range	Temporal	Spatial	Social	Hypothetical
Age	18-34	26.1%	24.5%	19.7%	19.6%
	34-44	14.9%	15.2%	16.7%	12.6%
	45-54	19.8%	16.9%	14.8%	18.7%
	55+	39.2%	43.5%	48.8%	49.1%
		X <sup>2</sup> =9.386, df=9, p=0.403 <sup>1</sup>			
Sex	Male	50.9%	55.3%	55.7%	48.1%
	Female	49.1%	44.7%	44.3%	51.9%
		X <sup>2</sup> =3.413, df=3, p=0.332 <sup>1</sup>			
Education	Low	18.9%	27.0%	26.2%	25.1%
	Middle	41.9%	38.8%	43.0%	40.0%
	High	39.2%	34.2%	30.8%	34.9%
		X <sup>2</sup> =8.612, df=6, p=0.197 <sup>1</sup>			
Household income	Below modal	28.8%	27.4%	24.1%	26.2%
	Modal	14.9%	16.5%	17.2%	18.2%
	Above modal	43.2%	42.2%	39.9%	40.7%
	Unknown	13.1%	13.9%	18.7%	15.0%
		X <sup>2</sup> =4.682, df=9, p=0.861 <sup>1</sup>			
Investing experience	1-60 years	11.27	12.47	12.61	13.08
		estimate=0.013, se=0.008, z=1.673, p=0.094 <sup>2</sup>			
Investment value	1-10 scale	3.3	3.43	3.63	3.79
		estimate=0.042, se=0.030, z=1.435, p=0.151 <sup>2</sup>			
Risk type	Cautious	21.6%	23.2%	22.7%	23.5%
	Neutral	63.5%	62.4%	58.1%	60.0%
	Risk-seeking	14.9%	14.3%	19.2%	16.4%
		X <sup>2</sup> =4.93, df=6, p=0.552 <sup>1</sup>			
Total investable capital	1-7 scale	3.01	3.11	3.25	3.37
		X <sup>2</sup> =15.6, df=18, p=0.621 <sup>1</sup>			
Pro-environmental attitude	Important	58.4%	58.9%	56.9%	52.6%
	Very important	13.2%	15.4%	18.6%	17.8%
		X <sup>2</sup> =3.949, df=3, p=0.267 <sup>1</sup>			
α=0.05, two-tailed					
<sup>1</sup> tested with a chi-squared test					
<sup>2</sup> tested with a logistic regression					

## **Appendix F: argumentation of the expected effect size**

It is expected that in the distant condition, there is a larger difference in allocation amount between the two options than in the proximate condition (with a higher mean of the sustainable fund). Soderberg et al. (2015) did a meta review that includes 179 studies and 426 effect sizes of the effect of psychological distance (temporal, spatial and social) on downstream consequences (predictions, evaluations and behaviours). Although similar direct effects of hypothetical distance were found, hypotheticality was not included here as there were only 4 studies on this dimension. Studies on hypotheticality do with exception of Todorov et al. (2007) not report effect sizes. Park et al. (2015) find differences in effect sizes between hypothetically far-condition (Hedges'  $g$  ranges from 0.39 to 0.45 in different experiments) and the hypothetically near condition (Hedges'  $g$  ranges from -0.30 to -0.37).

In the meta-analysis of Soderberg et al. (2015) with the three other dimensions, a mean effect size (Hedges'  $g$ ) of 0.526 was found, with a 95% confidence interval between 0.471 and 0.582. For evaluations specifically, the mean effect size is 0.503 and a 95% confidence interval between 0.43 and 0.57. The overall effect size adjusted for a possible publication bias is 0.383, 95% confidence interval between 0.33 and 0.43. The authors argue that "the unadjusted and adjusted confidence intervals provide us with a range of estimates about the size of that effect that capture the aggregated evidence currently provided by the literature". They find that the effect of distance replicates over different times, places and populations, and across different distance domains and outcomes (no significant difference between effects on evaluation, predictions and behaviours).

## Appendix G: average allocation per fund

Dimension	Sustainable fund	Practical fund	Control fund 1	Control fund 2
Temporal	€5861	€5181	€4310	€4609
Spatial	€5639	€4730	€4681	€4883
Social	€5485	€5457	€4412	€4663
Hypothetical	€5821	€4966	€4540	€4754
General	€5704	€5074	€4484	€4736

## Appendix H: education levels and risk attitudes of pro- and non-environmental participants

	Low	Mid	High	<i>Total</i>
Pro-environmentalists	119 (27.17%)	182 (41.55%)	137 (31.28%)	<i>438 (72.89%)</i>
Non-environmentalists	45 (27.61%)	65 (39.88%)	53 (32.52%)	<i>163 (27.12%)</i>
<i>Total</i>	<i>164 (27.29%)</i>	<i>247 (41.10%)</i>	<i>190 (31.61%)</i>	<i>601 (100%)</i>

*Table 1: Highest completed education levels of pro-environmentalists and others*

	Cautious	Neutral	Risk-seeking	<i>Total</i>
Pro-environmentalists	99 (22.60%)	268 (61.19%)	71 (16.21%)	<i>438 (72.89%)</i>
Non-environmentalists	34 (20.86%)	95 (58.28%)	34 (20.86%)	<i>163 (27.12%)</i>
<i>Total</i>	<i>133 (22.13%)</i>	<i>363 (60.40%)</i>	<i>105 (17.47%)</i>	<i>601 (100%)</i>

*Table 2: Risk attitudes of pro-environmentalists and others*