The Subjective Construction of Wealth and the Perception of Wealthy People. The Role of the

Social Sample, Social Comparisons, and Mental Representations

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Deutsche Zusammenfassung

Obwohl „Reichtum" ein Thema ist, mit dem sich schon die Philosophen der Antike beschäftigt haben, wird ihm in der Psychologie relativ wenig Aufmerksamkeit geschenkt. Diese Arbeit beleuchtet die kognitiven Prozesse, wie Individuen ein Urteil darüber fällen, ob jemand reich ist, und ob bestimmte Anhaltspunkte als subjektive Indikatoren für Reichtum dienen. In drei Kapiteln, die $k = 11$ Beobachtungs- und experimentelle Studien ($N = 2.315$) beschreiben, sollen drei Forschungsfragen beantwortet werden. Erstens: Inwieweit unterscheiden sich Individuen, wenn sie Reichtum definieren sollen? Zweitens: Gibt es universelle Hinweisreize für Reichtum, die Individuen verwenden, um reiche Menschen zu identifizieren? Und wenn ja, inwieweit sind diese Hinweisreize kontextabhängig? Darüber hinaus wird die Frage beantwortet, ob es situative Grenzen gibt, unter denen diese Hinweisreize nicht gelten. Die Ergebnisse zeigen, dass sich Individuen bei der Definition von Reichtum inter-individuell unterscheiden und dass Personen bei der Definition von Reichtum ihre Lebensumstände und situativ verfügbare Anhaltspunkte in Betracht ziehen. Darüber hinaus wurden Belege für ein kohärentes Modell von Reichtumshinweisen gefunden, das Hinweisreize beschreibt, die von Individuen verwendet werden, um reiche Personen (d.h. besonders wohlhabende Menschen) zu identifizieren, wobei die Gültigkeit dieser Merkmale von verschiedenen kontextuellen (z.B. kulturellen) Faktoren abhängt. Schließlich wurde festgestellt, dass durch die Isolierung einzelner Reichtumshinweise der mentalen Repräsentation dieser Merkmale diese möglicherweise nicht mehr als Indikator für reiche Menschen wahrgenommen werden. Aus den Schlussfolgerungen ergeben sich Grundlagen für weitere Forschungen über die Wahrnehmung von Reichtum, die insbesondere für den politischen Diskurs von Bedeutung sein können.

Schlüsselwörter: Kontextabhängigkeit, soziales Umfeld, Bezugspunkte, Kultur

Abstract

Although the concept of wealth is a topic that ancient philosophers have dealt with, relatively little attention is paid to it in psychology. This work sheds light on cognitive processes on how individuals derive a judgment about whether someone is rich and whether certain cues serve as subjective indicators of wealth. Based on three chapters that describe $K = 11$ observational and experimental studies ($N = 2,315$), three research questions shall be answered: First, to what extent do individuals differ when defining wealth? Secondly, are there universal cues of wealth that individuals use to identify rich people? And if yes, in what sense do these cues depend on the situation or context? Furthermore, it will be asked whether there are situational boundaries under which those cues do not apply. The present research shows that individuals differ in defining wealth and that they take their personal life circumstances and situational cues into account to define wealth. Moreover, evidence for a coherent wealth cue model was found that describes cues that are used by individuals to identify the rich (i.e., particularly wealthy people), whereby the validity of these cues depends on several contextual (e.g., cultural) factors. Lastly, it was found that by isolating individual wealth cues and looking at core mental representations of these cues, they may not be perceived as indicative for rich people anymore. The conclusions reported here set a foundation for further research on the perceptions of wealth which may be particularly relevant for the political discourse.

Keywords: context dependency, social circle, reference points, culture

Introduction

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Background

How do we know what wealth is? How do we recognize rich people? Answering these questions might vary between various countries and cultures, and from an evolutionarily perspective, this may have been different in the past than it is today. But are there psychological mechanisms that can potentially predict how individuals define wealth? If we can find the mechanisms for how people perceive wealth or make wealth judgments, this can have the potential to contribute to a general understanding of what wealth means to people and which consequences and implications go along with the perception and categorization of wealth.

Wealth judgments have been shown to go along with a variety of emotional and behavioral consequences that can negatively impact society. For example, some people might hold status and power only because they are perceived as rich and not because they have competence or the qualification for their power. Cheng and Tracy (2013) explain that cues that are used to identify rich people signal success and skill which can result in power and can induce a feeling of being threatened in those who are not rich. Another example is that wealth judgments can beget a feeling of relative deprivation and thus envy, whereby envy can lead to unethical behaviors in non-rich individuals who feel relatively deprived. Research has shown that this is especially true in low-cost situations where non-rich individuals do not have to worry about the consequences (Gino & Pierce, 2009, 2010; Zitelmann, 2020). This can be detrimental for individuals and the society because some subjective indicators of wealth might not be an objective indicator of wealth (i.e., some indicators of wealth might be based on personal opinions rather than objectively derived). Perceiving such indicators of wealth might lead to positive and negative biases against people who are perceived being rich (see for example Chapter 2).

Another example of how wealth judgments can have negative consequences is that wealthy people are stereotyped. Specifically, although many people do not even know millionaires, they still hold negative stereotypes against them (e.g., that they are greedy or do not deserve their wealth; Zitelmann, 2020). Lastly, it has been shown that cues of wealth can have consequences for judgments in court cases. For example, it was reported that richer individuals receive lesser sentences for the same crime compared to poorer individuals (Bagaric´, 2015). An explanation for this could be that certain stereotypes drive the decision-making process in judges. It was argued for example that people hold the belief that compared to poor people, rich people have a lot of social power, are generally respectable, and that they are seen to be prestigious (Cheng & Tracy, 2013) which might be a reason why richer (compared to poorer) individuals are sentenced less for the same crime. Thus, it is important to gain a better understanding of the concept of wealth from a psychological point of view, and the current study tries to understand how individuals derive a wealth judgment and to examine cues that are subjectively used by individuals to identify rich people.

Diverse Definitions of Wealth

Wealth can be defined in many ways and in the specialist literature there is no consensus about how it should be defined. Furthermore, it seems that lay people understand different things about wealth than scholars do (cf. Glatzer & Becker, 2009; Götte, 2015; Ragusa, 2015; Zitelmann, 2020). Notably, attempts to define wealth in an objectively way have been built on several distinct indicators. One can frequently find that authors define wealth based on objective or subjective criteria. While objective definitions aim at defining wealth from objective measurable resources of a person, such as assets or income (Concialdi, 2018), subjective definitions on wealth depend on the perceived value of an object for individuals (Götte, 2015).

Resources like drinking sparkling wine in a bar might, for example, signal wealth for those who cannot afford it, while for those who can afford it, special vintages of a very rare champagne might signal wealth.

Although objective definitions of wealth consider objective measurable goods of a person (such as income, assets, or realization opportunities; Volkert et al., 2003), objective definitions can be further divided by the question whether the definitions are based on statistical or normative indices (Concialdi, 2018). Statistical definitions of wealth frequently point to a given threshold in the distribution of income or assets at which one can say that someone is rich. For example, in Germany, the threshold for wealth is 200-300% above the median income (Grabka, 2014). Other statistical definitions set an arbitrary threshold such as 1 million Euro of assets (Leckelt et al., 2019) because there are only few people who have that amount of money. Again, other objective statistical definitions try to define wealth from a poverty line (Medeiros, 2006) or plead for more complex definitions of wealth because such definitions do not provide any reasoning where their proposed set-points come from (Concialdi, 2018).

Normative definitions on the other side emphasize that there should be certain, objective rules of how wealth should be defined based on what the society deems acceptable. For example, it was argued that an appropriate wealth threshold would be when a certain standard of living would be exceeded (Concialdi, 2018). Other authors argue that that one should not only consider the means of a person but also the opportunities to do certain things. It was for example argued that it is necessary to consider aspects of freedom and human rights when one defines a poverty line (Sen, 2005). The same might also apply for a definition of wealth. Only because one has many goods such as money might not necessarily mean that the person is rich, because that person might not have the opportunities to satisfy their needs (Sen, 2005), like people in

Venezuela in 2022 who use bank notes to braid bags from it. Lastly, one might also consider the moral component of wealth, that is, how fairly goods are distributed in a society. There are societies in which wealth is distributed relatively equally in the population, whereas in other countries few extremely rich persons possess more than the majority of individuals (Skopek et al., 2014).

Importantly, although there is no single definition to which specialists agree, there are clearly distinct concepts that are frequently used synonymous for wealth in the literature. These comprise for example (social) status, socioeconomic status, social class, and prestige. Specifically, *status* refers to respect, admiration, and voluntary deference of individuals to another person. It therefore refers to the reputation of a person and is not only about material wealth (Anderson et al., 2015). While status describes a rank within a society, the *socioeconomic status* is composed of income, education, and occupation and can therefore be considered as an index of economic opportunities within a society (Anderson et al., 2015). *Social class* on the other hand combines status and socioeconomic status as it is defined by wealth, education, and work as well as in the construction of individual class membership (Kraus et al., 2012). Lastly, *prestige* is considered as a rank given to a person based on respect for an individual's skill and knowledge (Cheng & Tracy, 2013). Prestige therefore refers to a person's standing in a society, while richness or wealth are more material, but might be able to produce prestige (Cheng & Tracy, 2013).

In the current work, the definition of wealth has been aligned with a common feature found in most definitions, namely its financial aspects. Specifically, wealth or richness was defined based on financial aspects in a broader sense. That is, things that also go hand in hand with finances (e.g., being in certain social circles). In other words, it is about material or

financial resources and the options that are available due to the financial resources. Although distinct from some other wealth definitions (e.g., normative definitions), it has the advantage that this definition can be potentially objective and that it focusses less on moral values.

From what was reviewed before it seems that there is no strong consensus about the definition of wealth. Notably, it seems that a definition of wealth always needs something with which one can compare it (i.e., a reference point). That is, there must be some kind of knowledge or a shared imagination about what the environment has to offer. Taking this further, this imagination might be influenced by time (the era), the culture, and by the (societal) context in which a person lives. For example, when money was not invented, individuals bartered with material goods such as cattle or land, which was deemed as primary source of wealth for a long time. Notably, money as a commodity first emerged when production was in surplus (e.g., through more productive cultivation or even such abusive forms of production like slavery) and when the possibility for barter transactions increased (Utiuzh & Pavlenko, 2019). Hence, other things like the possession of cattle (and not money) were the only goods that one could perceive as indicative for wealth in the pre-industrial era.

Nowadays and regarding culture, research examined that there are cultural differences in how wealth can be defined. In the western world, one frequently finds that certain technologies and specific brands are associated with wealth (e.g., Christopher et al., 2005; Christopher & Schlenker, 2000; Doob & Gross, 1968; Little et al., 2013; Maaravi & Hameiri, 2019; O'Guinn & Shrum, 1997; Sigelman, 2013). In contrast, children from a nomadic culture are taught that meat is synonymous with wealth and status (Lokuruka, 2006). Similarly, samples of South African Black Tswana children were obtained from three different settings: rural, urban, and semi-urban children (South Africa). It was shown that in these samples, children think that one indicator of

wealth is how much cattle a person possesses (Bonn et al., 1999). Cattle for example is something that is not related to wealth when one browses literature from the western world. Again, individuals from hunter-gatherer cultures, in the Melanesian islands, indicate that "(…) certain decorative ornamentation produced from difficult-to-obtain materials (e.g., arm shells and necklaces called "wampum") [are] also viewed, in some small-scale societies, as indicative of prestige (…) [and wealth]." (Cheng & Tracy, 2013, p. 105). Such wealth cues also rarely appear, in the western representation of wealthy individuals.

Regarding the situational aspect of what or who is perceived as wealthy, one might consider the following example: Imagine you are a young adult who wants to go to a festival. You just managed to get the money for your ticket, the travel expenses, and your food together. On the festival you see that they sell very expensive cocktails that you cannot afford, but the single ingredients are very cheap when you buy them separately in a grocery store. In this example, it can again be seen that a comparison standard is important. That is, under different circumstances these cocktails might be easily affordable and would be deemed as cheap, but here, at the festival one might consider everyone with such a cocktail as being rich, because they can afford such a cocktail. Thus, not only the time (era) and the culture might influence how people perceive or define wealth, but also the situational context might influence the perception of wealth.

Psychological Theories on the Perception of Wealth: What Theories have to Offer so far

So far, it was illustrated that the perception of wealth is influenced by the context. However, the naïve reader might argue that there must be some cues of wealth that are always a sign of wealth such as money, food, specific brands, or other wealth cues. Indeed, money might be an unmistakable cue of wealth. However, there are situations in which money loses all its

value. Food might be also a universal sign of wealth, but only in environments where food is scarce. Furthermore, a specific brand might also serve as an indicator for wealth, but only if you are one of few individuals who can afford to wear it. Moreover, one person might think that a family who has a house is rich, but a family who has a similar house might envy their neighbours because they also have a pool (Brickman & Campbell, 1971; Duesenberry, 1949; Nguyen, 2016; Runciman, 1966). Thus, when individuals try to define wealth, one comes quickly to the point to recognize that wealth is relative, which makes the definition of wealth and the identification of wealthy people very challenging for individuals. From this point of view, it might be that there are inter-individual differences and a certain degree of uncertainty in how most people would define wealth. Relatively common in all definitions of wealth or richness is however, that it is about being able to afford things (i.e., material resources as well as options and actions) that others cannot afford.

To simplify these considerations, one may explore psychological theories that explain how individuals develop impressions of wealth, enabling them to define it. Notably, however, so far there is only limited psychological research on the perception of wealth, which makes it necessary to adopt and to integrate several theories, because the perception of wealth might be influenced by specific circumstances that differentiate psychological mechanisms from other judgment domains, such as numeric cognition, as individuals tend to adopt an egocentric perspective and are influenced by stereotypes about the rich. For example, individuals are likely to take an egocentric perspective when they want to make judgments (Gilovic et al., 1999) such as judgments about wealth. This might not be the case when one tries to define a poverty line because poverty seems to be a concept that is easier for people to grasp. Götte (2015), for instance, found that 95% agree that poverty always goes along with a fundamental deprivation of

the needs of individuals. Secondly, as individuals tend to have stereotypes about the rich (e.g.,

Ragusa, 2015), the concept of wealth might be influenced by the opinion of individuals. That is,

it might be that several psychological mechanisms interact with each other (such as taking the

egocentric perspective into account while using stereotypes) when individuals try to make wealth

judgments. Thus, it is not only important to define the research question exactly, but also to find

appropriate theories and material to use for studying the perception of wealth. As can be seen in

Table 1.1 -a summary of selected theories and mechanisms that might be used to explain the

impression formation in the area of wealth- many theories fall short to make specific

assumptions when it comes to the perception of wealth. This makes it necessary for studies in

this area to generate or adapt well-established theories to be able to empirically examine what

wealth means for individuals. This will be done in the empirical parts in Chapter 1-3.

Table 1.1

Examples of proposed cognitive mechanisms that may influence the perception of wealth with their respective limitations.

Theory	Proposed mechanism based on the theories	Limitations
Subjective point of view to define wealth (Gilovic et al., 1999; Götte, 2015; Ragusa, 2015)	Based on subjective wealth images. For example, oneself is the reference point and seem as "normal" or "average". Thus, individuals who can afford (much) more than oneself are likely to be seen as rich / very wealthy.	The subjective point of view might not be accurate.
Fulfillment of basic needs and the capability approach (Kyrk, 1953; Sen, 2005)	Fulfillment of basic needs and the knowledge that some goods can fulfill these needs better than others may lead to specific wealth perceptions.	We do not know yet if the fulfillment of basic needs really relates to the perception of wealth and if so, to what extent. Specific hypotheses need additional assumptions.
Childhood status (Kyrk, 1953)	Habituation to living standards through childhood experiences that are taken as reference points to estimate wealth.	There are many confounding variables that might influence the perception of wealth such as the influence of growing up and what role it plays in moving out of home or not. Thus, specific hypotheses need additional assumptions.
Financial knowledge and education (Klontz & Britt, 2012)	Actual knowledge of how the economy works might lead to an imagination of wealth. Furthermore, individuals with high compared to a financial literacy might use more objective information to form an impression about wealth.	Effect sizes might be very low and there is research that shows that education has no influence on the perception of wealth (Robeyns, 2019).
Money beliefs (Prince, 1993)	Money beliefs might lead to affective reactions that might be used as a source of information to form an impression about wealth.	The mechanism depends on specific beliefs and hypotheses would be made based on individual beliefs.

Prospect theory (Kahneman & Tversky, 1979)	Decreasing marginal utility could explain the perception of wealth: According to this theory, people of high social classes need significantly more money to be rich than people of lower social classes.	This theory makes no assumptions of the perception of rich individuals. Furthermore, in order to fully test this theory, it is necessary to reach certain sub-populations of society that are reluctant to provide information about their finances.
Social cognitive theory of social class (Kraus et al., 2012)	Assumes social-cognitive tendencies: People with low rank have a focus on dealing with constraints and people with high rank have an individualistic focus. Wealth cues that focus on dealing with constraints should thus be more salient for people in low classes, and wealth cues that focus on individualism should be more salient for high social classes.	At the time of writing, there is no validated questionnaire to measure social-cognitive tendencies which makes it hard to test hypotheses regarding the perception of wealth.
Reference point theories (e.g., Brickman & Campbell, 1971; Tversky & Kahnemann, 1974)	The way individuals perceive and judge wealth is influenced by relative comparisons to past experiences or preset reference points	Overlook individual differences and subjective interpretations, which can vary widely across individuals and contexts. Additionally, these theories may not capture the complex interplay of psychological, social, and cultural factors that shape one's perception and evaluation of wealth.

Note. For illustrative purposes, this table is only a selection of potential (psychological) mechanisms and does not claim to be exhaustive.

Before describing the empirical studies that are the foundation of the current work, the following sections review current work on the perception of wealth. This work will be embedded into broader "meta-theories". I refer to the word "meta-theories" because the theoretical considerations of each chapter can be subsumed under these theories. The "meta-theories" and the current evidence that will be reviewed inspired the empirical research that will be described in Chapters 1-3. For example, in Chapter 1, a specific aspect of the anchor heuristic is used. Anchor heuristics fall under *reference point theories* that will be reviewed below. Similarly, the lens model (Brunswik, 1956) and theoretical considerations that will be described in Chapter 2 and Chapter 3 fall under the *social learning theory* that will also be described below. From these "meta-theories", I will derive three research questions which are thematically related to each other, and which will guide the discussion of how the studies can enrich our understanding of what people mean when they speak about wealth and rich people at the end of the current work.

Meta-Theories

Reference Point Theories

In the following, theories will be presented that assume that in order to make a decision, there must be a standard of comparison.

The Hedonic Treadmill

The hedonic treadmill (Brickman & Campbell, 1971) might be a good starting point to theorize how people form their impression about wealth and wealthy people. From the theory it can be derived that people get used to their current level of wealth and their current life circumstances and use this information as a reference-point to form an impression (e.g., about what they think is wealth). Their current living standard serves as a reference point from which individuals start to form an impression about normality and can thus be taken to answer the question of what deviates from normality. For example, the hedonic treadmill would predict that

individuals will not perceive themselves as being rich because they are used to their current level of wealth. Indeed, research that dealt with the perception of wealth has shown that individuals do not perceive themselves as being rich, even though they are actually rich (Bussolo & Lebrand, 2017; Melchior & Schürz, 2015; Ravallion & Lokshin, 2002).

Support for the presence of wealth set points can be found in Halleröd's (2004) study, where participants were asked about the amount of money needed to make ends meet. The findings revealed that individuals with higher incomes tend to estimate a higher amount of money that is needed to make ends meet in contrast to those with lower incomes. This supports the notion that people's perception of an acceptable standard of living is influenced by their current wealth status. The difficulty wealthier individuals face in envisioning themselves living within the minimum standa'ds they deem acceptable for the less fortunate aligns with the concept of the hedonic treadmill. It suggests that as individuals get used to their current circumstances, their perception of acceptable living standards may be shaped by their relative wealth, which aligns with the idea of the hedonic treadmill. Moreover, this finding highlights the subjectivity of individuals' impressions of others' living styles, which may often be invalid.

Some revisions of the reference point assumption of the hedonic treadmill have been made that might be relevant when one tries to adapt this theory to examine the impression formation of wealth. First Diener et al. (2006) state that reference-points are intra-individually different and that two individuals with the same amount of money can have different set points. Research has shown that this assumption is true. It thus seems for example that personality traits such as greed (Mussel & Hewig, 2016) affect how individuals use such set points.

Diener et al. (2006) added that it is possible that there are multiple set points in the life of people. The authors state that reference-points of happiness varies slightly over time and with increasing age. Applied to the perception of wealth, this could mean that younger and older

people have a different understanding about wealth, which may even be independent of the generation they were born in. Evidence for this can be derived from a research report of the federal ministry of labor and social affairs in Germany (Glatzer et al., 2008). The authors found that when people were asked what they think it means to be rich, especially younger persons would emphasize that money and luxury goods are important, whereas older people set more value on health and immaterial things. Other research has shown that, whereas younger people's financial satisfaction changes with their actual income level, there is a positive relationship between age and financial satisfaction mediated by financial assets and debts (Hansen et al., 2008). That is, older people seem to value assets and debts more than younger people who are more satisfied with a high income. Furthermore, Hansen et al. (2008) argued that compared to young people, older aged people can deploy different coping mechanisms, such as downward adjustment of needs or aspirations, for example, to cope with low possession of money. It therefore seems that considering the factor age is important when studying wealth.

The Cognitive Processing of Situational Cues: Selective Accessibility Model

The section before illustrates that individuals use reference points to make judgements and to form an impression about others and that reference points are influenced by different factors. A similar assumption was made by Tversky and Kahneman (1974) who observed that people use anchoring heuristics when they are asked to make numerical judgements. The use of such heuristics may be especially important when individuals are asked to quantify a value above which a person is rich. Researchers suggest that people use either present or self-generated numerical situational cues as reference points and generate numerical estimates by taking initial value (set point) and adjusting it until a plausible value is reached (Epley & Gilovich, 2001; Epley & Gilovich, 2006; Tversky & Kahneman, 1974).

To derive a plausible value, it was suggested that individuals use either assimilation or contrast strategies (Strack & Mussweiler, 1997). Specifically, when an initial value, whether it is a present or self-generated numerical value, is closely associated with the target, it can serve as a reference point for judgment. As a consequence, the response provided by a participant tends to be in close proximity to the initial value. This is what is meant by assimilation. However, if the initial value seems implausible or too extreme, people can take this value as a comparison value or simply ignore this value. This is what is meant by contrast.

Anchoring might play a role when people are asked what (numerical) values are needed to be rich (e.g., how much money does someone need or how many watches does someone need to be rich) and the prevailing assumption is that the psychological mechanism behind the use of anchor heuristics is that individuals selectively use available information to make a judgment under uncertainty (Strack et al., 2016; Strack & Mussweiler, 1997). Evidence for the existence of such a cognitive mechanism stems from experimental research in which participants were asked to estimate the year of a certain event (Epley & Gilovich, 2005; Mussweiler, 2001), the length or width of a certain object (Jacowitz & Kahneman, 1995; Mussweiler & Strack, 2000), or to estimate the temperature of certain places (Strack & Mussweiler, 1997). In this research, it was shown that individuals take numerical values for their judgments into account, even though they might be irrelevant to answer the question.

The Role of Social Learning

Next to reference points, another approach might also be fruitful to explain how individuals form an impression about wealth. The social learning theory (Bandura, 1977) (see Figure 1.1) explains that observations of other people lead to memory contents (i.e., representations) which can be used to evaluate the group affiliation or behaviors of others. That is, it is likely that learning processes influence the "emergence" of the reference point (e.g., by

the group/environment, etc.). For example, in one study (Mookherjee & Hogan, 1981) interviewers showed children young drawings of houses, cars and people (a father, a mother, a female child and a male child) with different clothes that were either expensive or not. The kids were then asked to 1) match the correct card pairs (e.g., a correct answer would be that the expensive house belongs to the family with the expensive clothes); 2) to tell the interviewer which father they assumed had the best education; and 3) to tell the interviewer with which child "upper class" children would rather play (another high or a low status child). The results of this study showed that children from the second grade onwards could already arrange the 'correct pairs' and could tell which father would have the best education. Furthermore, the researchers have shown that children of all examined ages made "correct" distinctions with whom they believed a rich child would rather play - namely with another rich children. The authors conclude that social class is already aware in children from the age of 5 years (see also Burkholder et al., 2021). Thus, based on studies like these, one can assume that young children have an understanding about wealth through social learning, because children might learn how cues or behaviors must be (spatial and temporally) combined to produce a desired response such as the (correct) answer to the question who is rich and who is not.
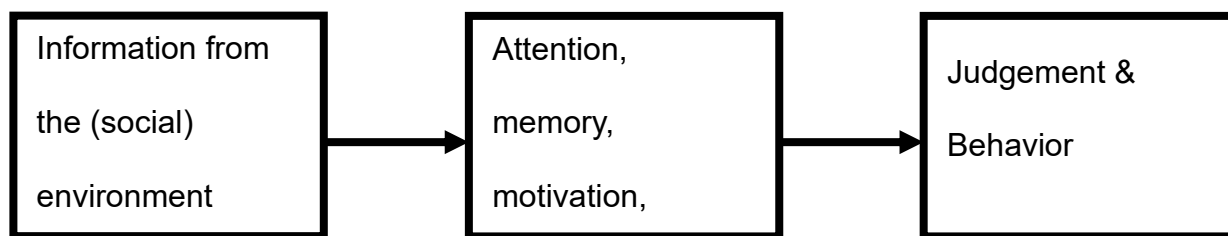
Figure 1.1

Shows a graphical overview of the social learning theory (Bandura, 1977).

The social learning theory postulates that individuals need attention, a functional memory, and must be motivated to learn from others. For example, a poor and hungry person might observe how someone who has a well-paid job enjoys a can of caviar. In this case, the observing person might be highly motivated to reproduce this (eating) behavior and to experience the same enjoyment as the person who s/he observes. However, the reproduction of this behavior may not be possible, because of the scarcity of this resource. Thus, the observing person might conclude that a well-paid job is necessary to also be able to eat a can of caviar. A (subjective) conclusion that the observing person might draw under these circumstances might be that the caviar eating person must be a rich person, because he works in that specific job, and s/he might further learn that under the current circumstances s/he´s unlikely to also get a can of caviar. The social learning theory (Bandura, 1977) thus illustrates that together with the personal life circumstances, the social environment can shape the mental representation of wealth.

A further concept that might shed light on the social learning process when it comes to wealth is the concept of conspicuous consumption (Veblen, 1899). Conspicuous consumption is defined as "the acquisition and display of expensive goods and services aimed at attaining social status, which occurs to varying degrees across the social spectrum" (Kumar et al., 2021, p. 1). It was argued that such differences occur because people from a higher class have the means and the opportunity to consume more exclusive things (e.g., food, clothes) that are reserved for the higher class than people from a lower class (Sen, 2005; Veblen, 1899).

Conspicuous consumption research has shown that individuals who have a high (compared to low) social class are motivated to show their wealth in order to fulfill specific social goals such as being recognized as being superior and capable to attain status and wealth (Kumar et al., 2022; Sundie et al., 2011). From this it might follow that there is a relationship between cues that are subjectively used to identify rich people and cues that are used by the rich in order

to fulfill this specific goal. To put it differently, people might be presented and take especially those visible cues of wealth into account that are able to attain a high status. This can depend on the context and is particularly likely when someone intends to impress other people (e.g., (Griskevicius et al., 2010), such as a potential partner (e.g., Griskevicius et al., 2007).

Indeed, an extensive literature review (see Table 1.2) that took place from August 2019 – August 2020 and in which I aimed to answer the question "how can I recognize rich people or how can I see wealth from the outside?" seems to confirm this assumption. The wealth cues that were used in these studies may be clustered into the following three dimensions "possessions" (e.g., cars), "behaviors" (e.g., non-verbal behaviors), and "physical looks" (e.g., physical attractiveness) and research that deals with dominance and status would also suggest that these cues show some degree of superiority over other people (e.g., Sadalla et al., 1987; Sundie et al., 2011). It thus seems that there are some indicators of wealth that are especially salient for individuals because they are frequently exposed by people from whom it is known that they are rich, so that there is a strong association of such cues and assumed wealth (see Table 1.2).

Table 1.2

Literature review on visible wealth cues

Authors and Year	Wealth Cues	Study Method
Ahl et al. (2019)	• Houses	• Experimental variation of the wealth cues
Becker et al. (2017)	• Cultural practices (e.g., interests in education, art, newspapers, television, and shopping)	• Observational study
Bertram-Hümmer and Baliki (2015)	• Visible wealth dimensions: ○ Housing ○ Transport ○ Livestock ○ Durables ○ Consumptions	• Visible indicators for wealth that were derived from Russian 'Life in Kyrgyzstan' (LIK) survey data were clustered with a factor analysis • The authors developed a visible wealth index
Bianchi and Vohs (2016)	• Rich people socialize less, but when they socialize, they are doing it rather with friends than with the family or neighbors	• Observational study about the relationship of income and frequency of socializing.
Bjornsdottir and Rule (2017)	• Faces: It is possible to detect the social class on faces even when their expressions are emotional neutral ○ The research suggests that attractiveness, positive affect, diligence, and well-being are responsible for this effect	• Experimental studies with different methods
Christopher and Jones (2004)	• Cars • Furniture • Kitchen • Appliances • Foods	• Experimental variation of the wealth cues • Manipulation was used in other studies (Christopher & Schlenker, 2000; Christopher et al. 2005)

Christopher and Schlenker (2000)	• Possessions:
	  ○ Cars
	  ○ Appliances
	  ○ food
		• Experimental study with variation of descriptions, derived from an earlier study

Crespo et al. (2013)	• Household type	• Observational study
Davis (1956)	• People can distinguish between living rooms from rich and poor people	• In this study, participants were shown picture of real living rooms
Dimaggio and Useem (1978)	• Art and art consumption (e.g., going to the theater) • Education	• Observational data about the differences in rich and non-rich people
Doob and Gross (1968)	• Cars	• Experimental variation of different (cheap/expensive) types of cars
Durante et al. (2017)	• Belief that rich people are cold and competent	• Experimental variation of the label "rich" and "poor" with a subsequent question about stereotypes of these groups (warmth and competence)

Ellis (1967)	• Voice (independent of content)
	  ○ good grammar
	  ○ educated choice of words / pronunciation
	  ○ good quality of voice
		• Participants were presented recordings and could correctly identify the social status

Garcia et al. (2019)	• Car • Watch • Coats • Brand clothes	• Used wealth cues as dependent variable
Giles and Sassoon (1983)	• Accent	• Experimental variation of the accent

Gillath et al. (2012)	• The researchers found that the shoes people wear are (accurately) used to estimate the income of that person	• Experiment in which the pictures of the shoes were taken from another set of participants
January et al. (2018)	• Light skin	• Observational study with students in Zimbabwe
Kraus and Keltner (2009)	• More self-grooming • More playing around with objects in social interactions • Less engagement (e.g. nodding, direct gazes) in social interactions	• Observational study in which social interactions of high and low status people were observed
Kraus and Mendes (2014)	• Clothes (suit versus sweatpants)	• Experimental variation of the wealth cues
Little et al. (2013)	• Food • Cars • Suits • Wristwatches	• Experimental variation of the wealth cues
Maaravi and Hameiri (2019)	• Car • Clothes • Country of residence	• Experimental variation of the wealth cues
Monsivais and Drewnowski (2009)	• Eating behavior / less calories, high nutritional value	• Observational study about the actual behavior of rich / poor people
Nelissen and Meijers (2011)	• Luxury brands	• Experimental variation of the brands
Ni et al. (2020)	• Leather-bound books • Bronzed lamp • Leather high-back executive chair.	• Experimental variation of affluence cues versus non-affluent cues in the testing room and the actual (high versus low) status of the participants.

O'Guinn and Shrum (1997a)	Examples: - Cars (with telephone) - Maids - Foreign travel - Jewelries	- TV-content analyses - The researchers searched for markers of affluence
Olson et al. (2012)	- Car - Houses	Experimental variation of the wealth cues
Piff et al. (2010)	- Less prosocial behavior than non-rich people: - Less generous - Less charitable	Experimental studies where it was shown that people belonging to the lower social class behave differently than those belonging to the higher class.
Ragusa (2015)	- Clusters (examples): - selfishness - happiness - powerful - democrat/liberal - stable - white - productive	- Shows how people think that wealthy people are with an open-ended answer format. - Responses were clustered
Scott et al. (2013)	- Car - Clothes	Experimental variation of different brands
Shutts et al. (2016)	- Houses - Clothes - Backpacks - Cars - Backyard playsets - Electronics	Experimental variation of the wealth cues

	• Vacation destinations	
	• "New objects"	
Sigelman (2013a)	• House	• Experimental variation of the wealth cues
	• Cars	
	• Clothes	
Skafte (1989)	• A person who can buy anything s/he wants	• Experimental variation of a person who is able/not able to buy anything s/he wants
Taylor and Nee (1988)	• Having a house with a well-kept garden and decoration	• Experimental variation of the houses

Tomlinson (2003)	• Lifestyle:
	  o high quality diet
	  o being active in the free time
		• Observational data from the years 1984/85

Tskhay et al. (2017)	• Faces	• Experimental variation of faces from dating websites

Note. The literature review was conducted as follows: A student assistant and I used the following search terms on at least the first 10 pages on GoogleScholar. Moreover, we searched on Ebsco and PsychInfo additionally to those articles that we knew already we generally. We searched for the terms: 'Subjective wealth images', 'Beliefs about rich people', 'Stereotypes rich people', 'Wealth cues', 'Wealth indicators', 'Wealth symbols', 'Affluence cues', 'Affluence indicators', 'Affluence symbols'. We searched for empirical papers in English and German language, exclusively in academic journals. Wealth cues had to be used as either a dependent (criteria variable) or independent (predictor) variable in these studies. With this, we scanned over 12,000 articles. Among all articles, we found $k = 35$ relevant manuscripts that matched our search criteria.

Social Representations

Although the social learning theory explains that memory contents can be formed by the observation of others, it is silent in answering the question how others around us are represented and stored in the memory. The social representation theory (Rateau et al., 2013) overcomes this limitation in that it assumes that individuals form a representation of subgroups of the society collectively, that is, in communication with others. Furthermore, the social representations are thought to be organized around a figurative core, shared by members of a group, and socially useful. Media research, conducted by Jahng (2019) and O'Guinn & Shrum (1997), provides evidence for the existence of shared social representations of the rich. This research reveals that individuals who consume media frequently tend to develop similar perceptions and imaginations about the characteristics of wealthy individuals. Specifically, researchers in this field (O'Guinn & Shrum, 1997) found that the frequency of television consumption among Americans was positively related to their estimation of how often certain symbols of wealth appear in American households.

To answer why these representations are useful, one can take the evolutionary psychology perspective into account. Specifically, Cheng and Tracy (2013) report that individuals are susceptible to what is known as prestige bias. The prestige bias describes the propensity of individuals to observe and to emulate the most accomplished and prestigious members of a social group (Cheng & Tracy, 2013) because from an evolutionary point of view, it was adaptive for human to learn from other individuals techniques that are able to most efficiently acquire high-quality goods, fitness-enhancing ideas, or behaviors. Thus, it seems that individuals from social groups share similar imaginations of how individuals from other social

groups look like. For the imagination about the rich, this might be the case because their ideas, possessions or copy-worthy behaviors are admired and envied.

Stereotypes about the Rich

Stereotypes about the rich offer further evidence for the existence of social representations of the rich and researchers from various fields systematically studied what stereotypes people have about the rich. To systematize this research, I propose a distinction between research that examined stereotypes based on the stereotype content model, which investigates how people evaluate rich people in terms of their competence and warmth (Fiske et al., 2002; Fiske, 2018), research regarding which valence and which personality traits people attribute to the rich, and research on other beliefs people have about the rich. Regarding research on the stereotype content model has shown that people believe that the rich are competent (Connor et al., 2021; Durante et al., 2017; Sarkar et al., 2020) and that it might be that the rich are seen as being cold (cf. Connor et al., 2021; Durante et al., 2017). In addition to that, it seems that the inference of competence regarding the rich is tempered by the general assumption that wealth was acquired by the rich with their own hands rather than by luck or other external means (Black & Davidai, 2020; Sarkar et al., 2020).

Regarding the valence of the rich, there is research that shows that the rich are favored over poor- and middle-class individuals (Horwitz & Dovidio, 2017) and that individuals ascribe positive facial characteristics to the rich, such as physical attractiveness or positivity (Bjornsdottir & Rule, 2017, 2020). Other research found that the rich are thought to have also at least ambivalent, if not clearly negative personality traits such as greed, materialism, arrogance, and self-centeredness (Parker, 2012; Ragusa, 2015; Zitelmann, 2020). Notably, some personality

traits that people ascribe to the rich (e.g., extraversion or openness) actually correspond to their own self-image (Leckelt et al., 2019).

Regarding the beliefs, it was concluded that individuals believe that the rich are healthier than poorer individuals (Macintyre et al., 2005). Furthermore, it was shown that some individuals believe that one can identify the rich on their spending behavior (Kappes et al., 2021) and that individuals would rather like to have rich neighbors who worked for their own money in contrast to those who have gotten it with luck (Christopher et al., 2005). Furthermore, it seems that some stereotypes are more pronounced when there is a greater social inequality in terms of class differences (Connor et al., 2021). Thus, individuals have lots of ideas how the rich are that fit to the general idea of a figurative core of the cognitive/social representation of the rich.

Social Comparisons

So far, it was argued that the impression formation process of individuals comprises that individuals use references points, which develop from information that people have learnt from their social environment, so that individuals have developed beliefs and stereotypes about the rich. However, social comparisons are a fundamental psychological mechanism in humans and influence a great deal of the daily life of humans, especially when individuals are uncertain how to objectively define a certain construct (Festinger, 1954). This might be especially true when individuals are asked what they think is needed to be rich.

So far there is only little research that has examined social comparison processes in the context of impression formation about wealth and the rich. However, Marx once said that a "(…) house may be large or small; as long as the neighboring houses are likewise small, it satisfies all social requirement for a residence. But let there arise next to the little house a palace, and the little house shrinks to a hut" (Marx as cited in Verme, 2013, p.4). It thus seems that the

observation and the interaction with other people also can influence what we perceive as being rich, and how we see rich people, because we compare ourselves (and our situation and belongings) with them. For example, it is known that in the Western world people are motivated to achieve better abilities (more possessions and more money) than other people, which is why they tend to use upward comparisons between how they are doing and how other people are doing (Boyce et al., 2010; Dembo, 1931; Festinger, 1954; Gerber et al., 2018). Thus, when such comparisons are active (e.g., when people are motivated to find an answer to the question what is rich), they are likely to influence the perception of wealth and accordingly wealth estimations. For example, the salience of a person who is doing better than the comparing person might serve as an anchor, so that the comparing person is likely to make an upward comparison. From this assumption, there can be drawn several possible hypotheses that will be empirically tested in Chapter 1.

Research Questions

To summarize, I argued that there are diverse definitions of wealth in the scientific literature. Furthermore, I argued that in order to estimate wealth, a reference point is needed, as well as a cognitive representation of rich people, which is formed collectively in interaction with others. In the following, I will derive the research questions based on these assumptions that should be empirically answered in Chapter 1-3.

Research Question #1

From the literature reviewed above, it becomes clear that there are diverse definitions of wealth, and that when people are asked to make judgements under uncertainty, they use reference points, such as selective available cues or available information, including information of other people around them (e.g., through social comparison processes). Thus, the first research

question that should be answered in the current work is: to what extent do individuals differ when they define wealth? If individuals indeed differ in their definitions of wealth, then it might be that this difference might be explained by the use psychological mechanisms that are used when people make judgements under uncertainties (e.g., heuristics, social comparisons). This research question will be answered by considering the results of Chapter 1 and 2.

Research Question #2

The current literature points to the direction that different cues can signal wealth and that information from the (social) environment such as social representations are used to make (evaluative) judgements about what or who can be considered as wealthy or rich. Furthermore, research on conspicuous consumption and research on stereotypes of the rich has found that individuals think that the rich are different from the rest of the population when it comes to the evaluation of their personality traits, their competence, and even their physical fitness. Accordingly, the second research question is: Are there universal cues of wealth that individuals use to identify rich people? And if yes, in what sense do these cues depend on the situation or context? This question will be answered in Chapter 1-3.

Research Question #3

Theories of social learning and impression formation suggest that cues that are used to determine the affiliation to a group are socially learnt in interaction with other people and that cues are stored in the memory of individuals. However, the question can be derived whether cues are always interpreted in the same way. Thus, conditional on the assumption that there are cues that individuals use to identify rich people, in Chapter 1-3, I will investigate whether there are situational boundaries and under which conditions those cues do not apply (i.e., under which conditions do these cues not seem to be a valid cue of wealth anymore)?

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Chapter 1: The Psychology of Income Wealth Threshold Estimations: A Registered Report

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Compliance with ethical standards and informed consent

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants. Study 2 and the Study 3 were ethically approved by the IRB of the Julius-Maximilians-Universität Würzburg (GZEK 2020-26)

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Abstract

How do people estimate the income that is needed to be rich? Two correlative survey studies (Study 1 and 2, $N = 568$) and one registered experimental study (Study 3, $N = 500$) examined the cognitive mechanisms that are used to derive an answer to this question. We tested whether individuals use their personal income as a self-generated anchor to derive an estimate of the income needed to be rich (= income wealth threshold estimation, IWTE). On a bivariate level, we found the expected positive relationship between one's personal income and IWTE, in line with previous findings that people do not consider themselves rich. Furthermore, we predicted that individuals additionally use information about their social status within their social circles to make an IWTE. The findings from study 2 support this notion and show that only self-reported high-income individuals show different IWTEs depending on relative social status: Individuals in this group who self-reported a high status produced higher IWTEs than individuals who self-reported low status. The registered experimental study could not replicate this pattern robustly, although the results trended non-significantly in the same direction. Together, the findings revealed that the income of individuals as well as the social environment are used as sources of information to make IWTEs, although they are likely not the only important predictors.

Keywords: Income wealth threshold estimations; subjective perception of wealth, affluence, the rich, heuristics, wealth estimation, social comparisons

Introduction

Social and economic inequalities have existed ever since there have been people. Some of these inequalities are directly visible, for example because some individuals possess goods that another person is not able to afford (Garcia Castro et al., 2021; Kappes et al., 2021); other types of inequalities are harder to grasp because they rely on concepts that are not uniformly defined, such as wealth by income (c.f. Arndt, 2020; Grabka, 2014; Melchior et al., 2015). Such types of inequalities greatly impact political preferences, increase negative emotions, and compromise the health of individuals who live in societies that they perceive to be unequal, especially in those individuals who do not profit from it (Dawtry et al., 2015; Garcia Castro et al., 2020, 2021; Pickett & Wilkinson, 2015; Ragusa, 2015; Zitelmann, 2020).

Most societies have strongly skewed income distributions, with many people earning relatively similar amounts of money and a few people who earn magnitudes of order more. In such situations, perceived inequality is likely to be considerably influenced by comparisons between 'ordinary people' and 'the rich'. As such, people's estimates of who can be considered as being rich are likely to contribute to their perception of inequality in a society. Thus, the present research deals with the origins of a potential source of perceived inequality. Specifically, we investigate how individuals derive an answer to the question what income is needed for a person to be considered rich. An understanding of the cognitive mechanisms that individuals use to answer this question might help to disentangle why individuals perceive economic inequality in a society by answering the questions of what wealth –an important source of economic inequality– is and of who the rich are.

In this paper we present two correlative and one experimental study in which we asked participants what income they think is needed to be considered as being rich (*income wealth threshold estimations; IWTE*). Specifically, we are interested in cognitive processes that lead to

an estimation for wealth by income and hypothesize that several heuristics may drive such estimations. Our first assumption is that the personal income of participants (*PI*) as well as the income of their social circle (*SC*; i.e., people with whom one interacts face-to-face at least twice a year, Galesic et al., 2012) serve as heuristic cues in IWTEs. We further hypothesized participants would derive IWTEs from social comparisons. On the basis of our correlative studies, we conclude that people use self-generated anchors and that people subsequently use social comparisons with others to make IWTEs. This is especially true for high income individuals. Our experimental results that aimed to validate this theory are inconclusive.

Estimating Wealth

Making IWTEs is a challenging task, especially for laypeople. One reason for this is that there are many and inconsistent definitions of wealth, even in the scientific literature (e.g., Arndt, 2020; Grabka, 2014; Melchior et al., 2015). For practical purposes, some researchers use distribution-based cut-offs as a definition (e.g., top 10 % income of the population), whereas others plead for more complex definitions (Arndt, 2020). Research moreover suggests that it is likely that the general population has various definitions of wealth (Götte, 2015). It has been found, for example, that people have various subjective wealth images in their minds, and that individuals vary substantially in their perception of how rich persons can be recognized. Götte (2015) reports that in a representational sample, around 60% of the participants agreed that wealth has something to do with money, and around 50% agree that it has something to do with material goods and social participation, respectively. From such a substantial variation about how wealth can be defined and how wealthy people might be recognized, it seems likely that people are uncertain what wealth exactly is. In other words, when people make IWTEs, either of their own will or because they are asked to do so in a survey or research setting, they are forced to make a judgement under uncertainty. Under such conditions, people are more likely to base their

judgments on easily available cues in the environment and apply judgement heuristics to these

cues (Epley et al., 2001, 2006; Kahneman et al., 1979; Mussweiler et al., 2001, 2004).

Anchoring

One of the most pervasive and robust judgement heuristics, particularly in numerical

judgments, is anchoring (Bahník, 2020; Epley et al., 2001, 2006; Mussweiler et al., 2001). In

anchoring, people use available numbers as starting points (i.e., anchors) and then adjust these

numerical values to reach a final judgment. Such anchors may stem from the environment (e.g.,

Bahník, 2020; Tversky et al., 1974), or people may generate anchors by themselves based on

what comes to their mind first (Epley et al., 2001, 2006; Mussweiler et al., 2000, 2004). Such

self-generated anchors are activated automatically when people are asked a question to which

they have no apparent answer (Epley et al., 2001, 2006) and typically are somewhat similar to the

answer that is sought. Once an anchor is generated, people make sequential decisions whether

this anchor is correct. A typical outcome of this process is assimilation, that is, the final judgment

is biased in the direction of the original anchor (Tversky et al., 1974). Assimilation might occur

for at least two reasons. First, people might test the hypothesis that the anchor is the correct value

and, as a result of positive hypothesis testing (Klayman et al., 1987), anchor-consistent

knowledge is readily available afterwards (Mussweiler et al., 2001). Second, assuming that

people have a relatively broad interval of intuitively plausible values and that people adjust the

original value by moving it in the direction of the plausibility interval, assimilation might occur

because people "(…) terminate once a plausible value is reached" (Epley et al., 2006; p. 311).

While assimilation is a regular effect of anchors, under specific circumstances, anchors

might also result in contrast effects. That is, the final judgment might be farther away from the

anchor-value when the anchor was present (e.g., Mussweiler et al., 1997). This might, for

instance, occur when the final judgment is on a different subject than the anchor value (e.g.,

temperatures in Antarctica and Hawaii; Mussweiler et al., 1997). Such conditions, however, are less likely for self-generated anchors. When it comes to IWTEs, multiple external and internal standards possibly affect judgments, such as numbers mentioned in media reports or anecdotal income values. In the present research, we focus on two potential sources for self-generated anchors which are likely to be used when people try to answer what income is necessary to be considered as rich: the personal income of a person and the typical income of a person's social circle.

Self-Generated Anchors

For several reasons, a persons' personal income (PI) can be expected to have a relatively high chance of being used as an anchor for IWTEs. First, people have more information about their own living conditions than those of others. A persons' PI is therefore likely to be the most certainly known information when it comes to income and wealth. As such, it can be assumed to be high in cognitive availability and applicability. Second, there is ample evidence for people to take an egocentric perspective when they make social judgments (Gilovich et al., 1999; van Veelen et al., 2016). It is therefore likely that individuals ask the questions: "how much money do I earn?" and "how much more is necessary to be rich?". Thus, one's own financial conditions are likely to be a starting point of further processing and people might intuitively define being rich as not normal or out of the spectrum of normal life. At the same time, people typically construe normality around their own conditions (Brickman et al., 1971), such that they might perceive their own income being close to a normal income. As such, it would be a likely starting point for finding a non-normally high income. Taken together, one's PI is likely to come to mind and thus exert an anchoring effect particularly while making IWTEs because it is certain, a typical starting point for social judgments, and because it defines normality for a person. Although research has found that the PI of a person is a poor predictor of several psychological money-related outcomes

(e.g., the PI is a poor predictor of the subjective wealth of a person; Gasiorowska, 2014), the particularly high availability and salience of PI as a certain income number to IWTEs makes it uniquely suitable as an anchor in this case. Indeed, existing evidence suggests that one's own income has an assimilative effect on IWTEs. For example, drawing on a representative sample of the German population, Götte (2015) reported that IWTEs increased as a function of participants' income. While people earning less than 60% of the median income reported a IWTE for monthly income of € 7,497, participants earning between 61% - 140% of the median reported a IWTE of € 9,529, and participants earning more than 140% of the median reported a IWTE of € 12,585. As another example, Robeyns et al. (2021), by drawing on a representative Dutch sample, report a "weak tendency for people with a higher income to place the riches line at a higher level" (p. 125). Thus, based on these considerations and other observations that started to examine IWTEs (Forgas et al., 1982; Glatzer et al., 2008), one might conclude that one's PI has an assimilative anchoring effect on IWTEs.

Such observations, however, are open to alternative interpretations. More specifically, there is ample evidence that perceptions of richness are impacted by peoples' social environment (e.g., Dawtry et al., 2019; Duesenberry, 1949; Galesic et al., 2018). For example, research by Galesic et al. (2012) suggest that people estimate the distribution of features (e.g., household wealth) in a population based on the distribution of that feature in their social circles (SC). In a similar vein, richer people assume a larger percentage of the population to be rich than poorer people (Dawtry et al., 2015; Dawtry et al., 2019). Indeed, just like the PI, one's immediate social environment is highly accessible and may provide a norm for normality. As such, the typical income of a person's SC also is a plausible anchor or a starting point to make IWTEs. Crucially, based on the general sociological principle of homophily (i.e., the tendency to surround oneself with others who are similar to oneself; e.g., McPherson et al., 2001), one can assume that one's

PI and the typical income of one's SC are also correlated which makes this assumption even more

plausible. Study 1 and Study 2 tested the relative contribution of the SC and PI to IWTEs.

Beyond Anchoring: Social Comparisons

So far, we have argued that people can draw on two available cues when making IWTEs:

the PI and the typical SC income. However, besides one's PI and the typical income of the SC, a

persons' income status can also be expected to affect IWTEs judgments. Knowledge about one's

income status might be available in memory and thus simply retrieved when needed (e.g., Galesic

et al., 2012; 2018). At other occasions, however, people must infer their status from available

information in their environment, often based on social comparisons.

Numerous studies suggest that peoples' relative economic status correlates with various

money-related outcomes. For example, it has been shown that the social environment relative to

one's own standing relates to various money-related outcomes such as income happiness or

perceived subjective-relative-deprivation (Boyce et al., 2010; Clark et al., 2010; Galesic et al.,

2012, 2018; Graham et al., 2001; Hirschman et al., 1973; Jackson et al., 2020). Furhermore,

abundant research suggests that social comparisons have powerful effects on judgments and

behaviors in general (e.g., Kim et al., 2017; Mussweiler, 2003; Mussweiler et al., 2004) and when

it comes to responses to economic factors (e.g., Cheung et al., 2016; Hill & Buss, 2006;

Hirschman & Rothschild, 1973; Jetten et al., 2017; Sánchez-Rodríguez et al., 2019).

Importantly, research on the perception of social status has repeatedly shown that

individuals think that they belong to the middle class when they are asked to estimate their social

status, even when they have a comparatively high objective income (Bussolo et al., 2017; Dineen,

et al., 2019; Melchior et al., 2015; Ravallion et al., 2002). Thus, it seems that it is difficult for

individuals to classify themselves into their correct (objective) social class. It might therefore

follow that social comparison processes that we assume to be used to make IWTEs are not based

on absolute standards (e.g., what other individuals actually have) but rather on subjective

standards (i.e., one's own perceived status position within ones' social circle; *SC perceived*

status).

How might social comparisons affect the generation of IWTEs? In the present research,

we tested the hypothesis that comparison processes modulate the anchoring processes described

so far, especially those relating to the effect of a perceiver's PI. Existing evidence and theory

suggest that social comparison processes can be rather complex and can be modulated by several

personal and situational factors (e.g., Gerber et al., 2018; Mussweiler, 2003). Applied to the

present situation, we can derive that, depending on whether people perceive themselves to be

better (downward comparison) or worse off (upward comparison) than a relevant standard of

comparison (e.g., their SC income), their own income will appear to them as being higher

(contrast from downward comparison) or as being lower (contrast from upward comparison) than

without such comparisons. How could such a contextualization of one's PI affect IWTEs? We

hypothesize that the relative financial standing of persons moderates the anchoring effect of their

PI.

Specifically, if a person believes their PI to be relatively low within their SC based on

social comparisons, then this indicates that it is probably a long way to go from the PI to wealth.

Accordingly, the adjustment applied to an anchor can be expected to be relatively large; the lower

a person perceives the own status, the larger. That is, the subjective feeling of being lower class

would then proportionally increase the IWTE compared to individuals who perceive themselves

having a higher class.

This assumption is in line with theorizing of Mussweiler et al. (2004) that individuals who

have standard-consistent knowledge available (e.g., 'I have a high PI and a high status within my

SC, therefore I am well off') assimilate towards the evaluation standard (e.g., '…this must mean

that I do not need a lot more to be rich') to make their judgements. Conversely, Mussweiler et al. (2004) theorize that individuals who have standard-inconsistent knowledge available (e.g., 'My PI may be high but I have a low status within my SC, therefore I am far away from being wealthy') are likely to contrast away from the standard to make their judgements ('…this must mean that I have to add a lot of money on top of my PI'). This reasoning suggests that, given that IWTEs are derived from comparisons of PI with the SC perceived status, then individuals with a high status and a high PI would assimilate towards the standard, resulting in in a proportionally lower IWTE than individuals who have a high PI but perceive a low status.

Alternatively, a different moderation pattern may also occur. Research has shown that people are not willing or are not able to perceive themselves as being rich even when they are objectively seen in a high-income class (Bussolo et al., 2017; Dineen, et al., 2019; Melchior et al., 2015; Ravallion et al., 2002). One can therefore expect that individuals who indicate that they have a high PI and a high perceived status would assume that the wealth threshold is much higher than individuals who indicate a high PI and a low status because these individuals might be motivated to avoid to be seen as being rich. Individuals with a high PI and a low status would not need to think like this, because they perceive their comparison group as being rich and they can therefore justify that they are not rich. Our research aims to clarify which theoretical account holds true if social comparisons take place to make IWTEs.

Summary of potential mechanisms

Heuristic 1: *People use their PI as an anchor for IWTEs.* Multiple lines of theory and evidence suggest that individuals focus on their current life circumstances (e.g., their PI) as a basis for IWTEs. Combined with the tendency to perceive oneself as middle-class rather than rich, this suggests a simple heuristic of adding an arbitrary value to one's PI to generate a IWTE.

That is, a positive relationship between the PI and the IWTE can be expected if Heuristic 1 operates.

Heuristic 2: People use the income of their SC as an anchor for IWTEs. In line with social circle theories, people might use the income of others around them as a self-generated anchor without actually comparing their own goods with that of others. Thus, a positive relationship between the income of the SC and the IWTEs can be expected if Heuristic 2 operates.

Heuristic 3: People use their SC perceived status as a cue during IWTEs. Theory and evidence on social comparisons suggest that people compare their PI with the income of others around them. This means that people do not merely use their own or assets of others as cues, but also use their subjective status position in their SCs while deriving IWTEs. If social comparisons affect IWTEs, people's (subjective) relative positions within their SCs (SC perceived status) can be expected to explain variance in individuals IWTE. More specifically, if relative income status functions as a cue for assimilation or contrast, adjustment in anchoring can be either expected to be large when a person has a relatively low status or small when a person has a relatively high status. Alternatively, as argued above, the observed tendency for individuals to avoid self-categorization as rich could lead to the opposite pattern of small adjustments for relatively low status and large adjustments for relatively high-status individuals.

The Present Research

After an initial preliminary study with a student sample ($N = 85$; see supplements), Study 1 was designed to examine the relative importance of Heuristic 1 and Heuristic 2 (and hence of PI and SC) for IWTEs. Study 2 replicated and extended the results of Study 1 by also examining the relative importance of Heuristic 3. Study 3 (the Registered Report Study) seeks to provide a confirmatory test of the theoretical assumptions derived from these studies.

General Method for Studies 1 & 2

A summary of the sample, the collected items, hypotheses and aims of the studies can be derived from Table 2.1. In both studies, participants were asked to report their PI and the income of the SC and were then asked to make an IWTE. Afterwards, they were asked other questions (see Table 2.1) as well as to indicate their demographics. Lastly, participants were educated about the purpose of the study and thanked for their participation.

Table 2.1

Overview of the study measurements.

	Study 1	Study 2	Study 3
N(excluded)	192(20)	376(24)	500(115)
Data collection	German mturker	German sample from prolific.co	German sample from prolific.co
Age	90% were under 40 years old; median age was between 25 and 29 years old	$M = 28.74$, $SD = 8.13$	$M = 31.15$, $SD = 9.82$
Other demographics (incl. sex)	$n = 37$ female; Students (22%), apprenticeship (14%), employees (30%), freelancer (11%), unemployed (5%)	$n = 231$ female Approx. 80% had a general qualification for university entrance or a higher educational degree	$n = 188$ female, $n = 190$ male, $n = 7$ diverse Approx. 50% had a general qualification for university entrance or a higher educational degree; approx. 40% were students and 44% were
PI measurement	Categorical with 7 income categories (Galesic et al., 2012)	Open ended	Open ended employed
SC income	Estimated modal income, categorical with 7 income categories (Galesic et al., 2012)	Open ended	Manipulated
IWTE measurement	Open ended	Open ended	Open ended
Other important collected variables	n.A.	-SC ladder question (adopted from the MacArthur ladder) -Exploratory questions (see supplements)	-SC ladder question (adopted from the MacArthur ladder) -Manipulation Checks
Aim of the study / hypotheses	Pre-Registered: Tests the hypothesis that the PI and SC both are positively related to the wealth estimation.	Pre-Registered: Tests the comparatively the hypotheses that social comparisons are (not) used to make a IWTE.	Experimental manipulation of the status within ones SC to test the proposed mechanism derived from Studies 1 and 2

Note. PI = Personal income, SC income = modal income of the social circle; the currency was requested in Euro; Participant exclusions were carried out in line with preregistered criteria: (1) Failing an attention check (Study 1 and 2). (2) Participants who indicated that more than € 50,000 monthly net household income is needed to be rich which represented approximately 5% of a previous study with a representative German sample (Götte, 2015) (Study 1-3) (3) participants who showed signs of bad data quality according to (Leiner, 2019; Study 2-3). Lastly, (4) non-German residents were also excluded in Study 1-2 (if any) to ensure the comparability of the studies and the participants.

The data, material, appendices, and supplements can be found here: https://doi.org/10.17605/OSF.IO/PXAUB. All studies were conducted with German samples. The variations between the studies allowed for different analyses addressing specific questions from study to study. In each study, we collected data about the IWTE, the PI and the modal income of the SC, that is, the income level that is most common in the SC. IWTE was measured by asking participants for a net income (after taxation and social security contributions) that is needed to be rich.

The pre-registrations for Study 1 can be found on https://doi.org/10.17605/OSF.IO/VGY3X; for Study 2: https://doi.org/10.17605/OSF.IO/R6GQB and the pre-registration of Study 3 can be found on https://doi.org/10.17605/OSF.IO/JN4QX. Although the first and second study were preregistered with hypotheses and planned analyses, our analytic strategy evolved over time. Thus, the analyses presented deviate from the preregistration in some points because of feasibility and due to the interest of better applicability and comparability of the studies (see supplements for the data and the preregistered analyses). All procedures performed involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Study 1, 2, and 3 were ethically approved by the IRB of the Julius-Maximilians-Universität Würzburg (GZEK 2020-26). Appropriate informed consent was obtained from all participants prior to the studies.

Study 1

Study 1 was designed to provide a sensitive test for our notion that people might base IWTE's on both Heuristic 1 and Heuristic 2. Based on existing evidence and theories, we expected both variables (the PI and modal income of the SC) to positively relate to IWTEs, but we had no

reason to assume one of the two being an exclusive predictor. Descriptives for this study can be

found in Table 2.2, suggesting that we were successful in drawing a sample in which PI and SC

show similar variance. Intercorrelations between the key variables are displayed in Table 2.3. On

average, participants indicated that approximately € 9,550 are necessary to be rich. In this study, 18

out of 192 participants (approx. 9.38%) indicated that their PI is in the same or in a higher category

as their IWTE is.

Table 2.2
Descriptives of the study items in Euro, Study 1

	IWTE	PI	SC income
M	9,553.30	3.52	4.30
SD	8,000.00	4.00	4.00
Median	8,589.30	1.99	1.53
Minimum	1,000	1	1
Maximum	50,000	7	7

Note. $N = 192$; Categories for PI and SC income are: 1 = € 0-1000; 2 = € 1001-1500; 3 = € 1501-2000; 4 = € 2001-2500; 5 = € 2501-3000, 6 = € 3001-5000; 7 = € 5000 or more

Table 2.3
Intercorrelation of the study items in Study 1

	1	2	3	4
1. IWTE	-			
2. PI	.17*	-		
3. Income SC	.24**	.48**	-	
4. Sex	.01	-.02	-.08	-
5. Age	.05	.26**	.08	.24**

Note. $N = 192$, *$p < .05$, **$p < .01$; Sex: 1 = male; 2 = female

The bivariate correlations suggest that the PI as well as the modal income of the SC are

positively related to the IWTE. Moreover, however, PI and SC were substantially correlated (Table

2.3), thereby opening up the possibility that part of the shared variance of PI and IWTEs is actually

driven by variation in SC.

Regression analyses of IWTE on PI, the modal income of the SC with sex and age as control variables (Table 2.4) showed that the PI was a significant predictor only when the modal income of the SC was not included in the model, but modal income of the SC remained significant in all models, even after controlling for sex and age. Tests on multicollinearity show that none of the variables was redundant (all VIF < 1.4).

Table 2.4
Stepwise regression (Study 1); with the income wealth estimation as criterion variable

Predictors	B	SE	β	t	p	VIF	R^2(adj.)	F
Step 1							.00(.00)	< 1
Sex	33.23	1612.89	.00	0.02	.984	1.06		
Age	238.16	371.52	.05	0.64	.522	1.06		
Step 2							.03(.01)	1.81
Sex	362.38	1602.85	.02	0.23	.821	1.07		
Age	3.57	382.37	.00	0.01	.993	1.15		
PI	723.86	324.20	.17	2.23	.027	1.08		
Step 3							.06(.04)	3.08*
Sex	633.27	1582.37	.03	0.40	.689	1.07		
Age	32.73	376.82	.01	0.09	.931	1.15		
PI	281.49	362.12	.07	0.78	.438	1.39		
SC Income	1180.76	455.68	.21	2.59	.010	1.31		
Step 4							.06(.04)	2.49*
Sex	599.74	1588.00	.03	.38	.71	1.08		
Age	26.39	377.98	.01	.07	.94	1.15		
PI	-111.01	1020.24	-.03	-.11	.91	11.00		
SC Income	925.85	769.45	.17	1.20	.23	3.71		
PI x SC income Interaction	84.03	204.14	.12	.41	.68	17.70		

Note. $N = 192$, $*p < .05$

To provide a preliminary test of Heuristic 3, we conducted a fourth (non-pre-registered), step in the regression analysis and included the interaction term between PI and SC income. Results show that there was no significant interaction between PI and SC income.

Discussion

Study 1 provides important evidence for the positive relationship between PI and IWTEs, both on the level of first-order correlations and in regression analyses. This corroborates the

importance of the PI and the social environment as a source for anchors that feed into the wealth threshold estimation process (e.g., Dawtry et al., 2015; Galesic et al., 2012; 2019) and thereby replicating earlier observations (e.g., Götte, 2015; Robeyns et al., 2021). At the same time, our regression analyses suggest that the relation between PI and IWTEs might rest on the shared variance with SC income. These observations are in line with the notion that people's social surroundings are an important source for judgments about economic matters (Clark et al., 2009; Duesenberry, 1949; Galesic et al., 2012). Thus, from this point of view, it seems that the PI is a less important anchor than the SC to make IWTEs.

Furthermore, we observed no significant interaction between the PI of the participants and the modal income of their SCs. The literature suggests that this absence is not due to the fact that there is a high multicollinearity between the variables. As suggested by Mayerl and Urban (2020), it is very likely that collinearities appear when calculating an interaction term and then including it into a regression model with the variables from which this interaction term has been calculated. The authors also note that this is no problem for the calculation and that no transformation is needed to overcome the high VIF values. Thus, it seems that the objective status differences based on one's PI do not play a big role in making IWTEs in individuals. Instead, it might be that the subjective status plays a much bigger role when individuals try to make IWTEs. As we argued at the beginning, it is likely that individuals have difficulties categorizing themselves into their objective social class, which might be a reason why the subjective (compared to objective) social class is more important to make IWTEs. We tested this assumption in Study 2.

What we can conclude in the interim, however, is that the results are compatible with earlier research, indicating the existence of a "belonging to the middle-class effect" (Bussolo et al., 2017; Dineen et al., 2019; Melchior et al., 2015; Ravallion et al., 2002). According to this research, it was

suggested that individuals tend to assume their current life circumstances to be normal (see also Brickman et al., 1971). As a consequence, when the typical SC income is used as an anchor, people will adjust their judgments in an upward direction.

In sum, the results contradict our pre-registered hypothesis of an independent contribution of Heuristic 1 and Heuristic 2. If reliable, this observation would be of great importance for theory and research aimed at understanding the cognitive processes that lead to a perception of wealth by income, because it clarifies the psychological path by which PIs affect IWTEs. Furthermore, the absence of a significant interaction between participants PI and SC income so far indicates that participants most likely rely on the income of their SCs and thus take the income that is mostly common in their SCs as anchors to derive IWTEs. Study 2 aims to replicate the previous results and to test whether individuals use subjective comparisons, as opposed to objective ones (Heuristic 3), to derive IWTEs with the use of a different measurement than in Study 1.

Study 2

Given the unexpected nature of some results of Study 1, an important goal for Study 2 was to replicate the basic set-up of Study 1 with a large sample and a slightly different operationalization of the two predictors (see Table 2.1). More specifically, we collected the same variables as before, however this time with an open-ended answer format. In addition, Study 2 was geared towards testing of the operation of Heuristic 3. That is, we aimed at directly testing whether the PI has differential effect on IWTEs depending on the participants' SC perceived status. As suggested in the literature section, one's SC perceived status may be better to explain how individuals derive an IWTE than the objective status (i.e., PI in relation to others' income). Towards this end, we assessed participants' subjective income status relative to their SC with an adaptation of the MacArthur scale (Hoebel et al., 2015). More specifically, participants were asked to position themselves relative to

their SCs ranging from 10 (at the top) to 1 (at the bottom) in terms of education, finances, jobs etc. As argued above, we expected the anchoring effect of participants' PI to be either stronger (based on contrast processing) or weaker (based on avoiding self-categorization as rich) the lower their position within their SC is.

Results and Discussion

The descriptives are depicted in Table 2.5 and the intercorrelations of the variables used in this Study can be found in Table 2.6. We found that only a small proportion of people, namely 11 out of 376 participants (3%) indicate that they have the same amount of (or more) money as they would indicate how much money is needed to be rich. On average, participants' results show that € 6,554.56 more per month (with a median at € 6,024.96) is needed to be rich. In isolation, these observations support the notion that people avoid or are not able to consider themselves as being rich (Bussolo et al., 2017; Dineen et al., 2019; Melchior et al., 2015; Ravallion et al., 2002).

As in Study 1, the PI of the participants correlated positively with the IWTE which supports the assumption of the operation of Heuristic 1 (Brickman et al., 1971; Kyrk, 1953). Also replicating observations from Study 1, the SC income was positively related to the IWTE, indicating that the SC is used as an anchor while generating IWTEs. Further supporting the notion that the SC serves as an anchor, the IWTEs were significantly higher ($M = 8,818.68$, $SD = 6,055.27$) than the perceived modal income of the SC ($M = 2,600.55$, $SD = 1,287.82$), $t(375) = 20.2$, $p <.001$, $d = 1.04$. Thus, participants are not simply adopting the SC value. Instead, the data suggests that the SC is used as a starting point for adjustment.

Table 2.5

Descriptives of the study items in Euro, Study 2

	IWTE	PI	SC income
M	8,818.68	2,285.98	2,600.55
SD	6,055.27	1,701.80	1,287.82
Median	7,000.00	1,950.00	2,500.00
Minimum	1,000	0	0
Maximum	4,1000	1,1000	8,000

Note. $N = 376$

Table 2.6

Intercorrelations of the study items in Study 2

	1	2	3	4	5
1. IWTE	-				
2. PI	.16**	-			
3. Income SC	.17**	.51**	-		
4. Ladder	-.06	.29**	.14**	-	
5. Sex	.09	.08	.01	.01	-
6. Age	-.02	.12*	.11**	-.01	-.06

Note. $N = 376$, $*p < .05$, $**p < .01$; Sex: 1 = female, 2 = male

Comparing the Heuristics 1 and 2. In Study 1, we unexpectedly observed that the PI had no unique predictive value for IWTEs above and beyond the SC. To test the reliability of this observation, we applied the same regression as in Study 1 to the data obtained in Study 2. The results (see Table 2.7) fully replicate the results from the regression in Study 1 (Table 2.4). More specifically, the PI had no significant predictive value for IWTEs in an analysis where it was simultaneously used with SC (Table 2.8, model 3). In tandem with the reliable and positive correlation between PI and SC (Table 2.3), this suggests that the observed bivariate correlation between PI and IWTE might in fact be driven by SC as a proximal determinant of IWTEs.

Table 2.7

Stepwise regression (Study 2); with the income wealth estimation as criterion variable to test Heuristic 1 and 2

Predictors	*B*	SE	β	*t*	*p*	VIF	R^2(adj.)	*F*	BIC
Step 1							.01(.00)	1.73	7538.20
Sex	1176.18	652.75	.09	1.80	.072	1.00			
Age	-14.46	38.94	-.02	-0.37	.711	1.00			
Step 2							.03(.03)	4.24**	7514.88
Sex	1013.28	647.82	.08	1.56	.119	1.01			
Age	-28.30	38.78	-.04	-0.73	.466	1.02			
PI	0.56	0.19	.16	3.03	.003**	1.02			
Step 3							.05(.04)	4.38**	7516.09
Sex	1051.51	644.84	.08	1.63	.104	1.01			
Age	-32.78	38.64	-.04	-0.85	.397	1.02			
PI	0.33	0.21	.09	1.55	.123	1.37			
SC income	0.61	0.28	.13	2.16	.031*	1.35			

Note. N = 376, *p* < .05; **p* < .01

Table 2.8

Stepwise regression (Study 2); with the income wealth estimation as criterion variable to test Heuristic 3

	B	SE	β	t	p	VIF	R^2(adj.)	F	BIC
Model 1							.04(.03)	3.53**	7521.83
Sex	1053.33	645.58	.08	1.63	.104	1.01			
Age	-33.67	38.74	-.05	-.87	.385	1.02			
PI	.50	.45	.14	1.10	.271	6.00			
SC	.72	.40	.15	1.82	.070	2.71			
PI x SC	$-4.96E^{-5}$	.00	-.07	-.42	.678	9.50			
Model 2							.08(.06)	5.24***	7514.55
Sex	-35.49	38.11	-.05	-.93	.352	1.01			
Age	1123.71	636.04	.09	1.77	.078	1.02			
PI	2.37	.69	.66	3.44	.001**	14.58			
SC	.49	.28	.11	1.78	.077	1.38			
Ladder	226.69	278.53	.07	.81	.416	2.55			
PI x Ladder	-.30	.10	-.62	-2.94	.003**	17.49			

Note. $N = 376$, *$p < .05$; **$p < .01$

Heuristic 3: Social comparison processes

While the observations so far suggest that PI might not have a unique role while people generate IWTEs, our reasoning regarding Heuristic 3 implies that effects of PI potentially occur in interaction with a person's social standing. More specifically, we predicted that PI will be positively related with IWTEs depending on a person's perceived economic standing. For a first exploration of this assumption, we calculated a difference score between ones PI and the income of the SC and correlated this difference term with IWTEs. Put differently, we explored whether one's social standing might be related to IWTEs. Results revealed that there is no significant bivariate correlation between those variables ($r = .034$, $p = .515$). Thus, it seems that individuals do not simply rely on their "objective" standing within their SCs. In the following analyses, we therefore drew on the income of the SC and the MacArthur measure of participants' SC perceived status (high values indicate a higher status in one's SC than a lower value)[1]. We further seek to examine systematically which model can explain best the cognitive process that might be at work to derive WTEs.

To do so and to examine whether social comparison processes are at work, we carried out two regression analyses on IWTE (Table 2.9). This first regression model tests the relevance of the objective status for IWTE. In Model 1, we used sex and age, a person's PI, the income of the SC and an interaction term between the PI and the income of the SC to predict IWTE. If

[1] Deviating from this approach, we pre-registered that we would calculate a numeric variable that describe among others the difference between the PI and the modal income of the SC and other differences. We furthermore pre-registered that we would then use these variables to conduct linear regression analyses with those variables to compare model fits to come closer to an answer whether participants use social comparisons to make IWTEs. Unfortunately, this approach leads predictors to correlate with each other, leads to a multicollinearity problem and redundant predictors in the model.

participants use their objective status to contextualize their PI, the interaction term should prove

significant. The second regression model tests the relevance of participants' subjective status for

IWTE. Thus, Model 2 uses the interaction between PI and a person's SC perceived status

(instead of the objective status) to predict IWTEs.

Results reveal that Model 2 has the best fit (BIC) out of all the regressions that we

conducted in Study 2. As can be seen in Table 2.9, in this model, additionally to the PI, the

interaction term proved to be a significant predictor of IWTEs. Figure 2.1 visualizes the nature of

the interaction. In line with the social comparison hypothesis, the relationship between PI and

IWTE proved to be different for participants with a high vs. low SC perceived status. More

specifically, participants with a low subjective status added higher amounts to their PI while

generating their IWTE than high status participants did. This is evident in the steeper slope for

low compared to high status participants.

Table 2.9
Regression analyses Study 3

Predictors	*B*	*SE*	β	*t*	*p*	R^2(adj.)	*F*
Pre-Registered						.038(.023)	2.50*
Dummy Sex 1	-6666.63	1981.22	-.64	-3.37	<.001		
Dummy Sex 2	-6393.38	1984.52	-.62	-3.22	.001		
Age	38.07	27.06	.07	1.41	.160		
Condition	-.08	.07	-.22	-1.16	.249		
PI	-421.14	568.39	-.04	<1	.459		
PI x Condition	.06	.06	.18	<1	.331		

Note. *$p <$. 05
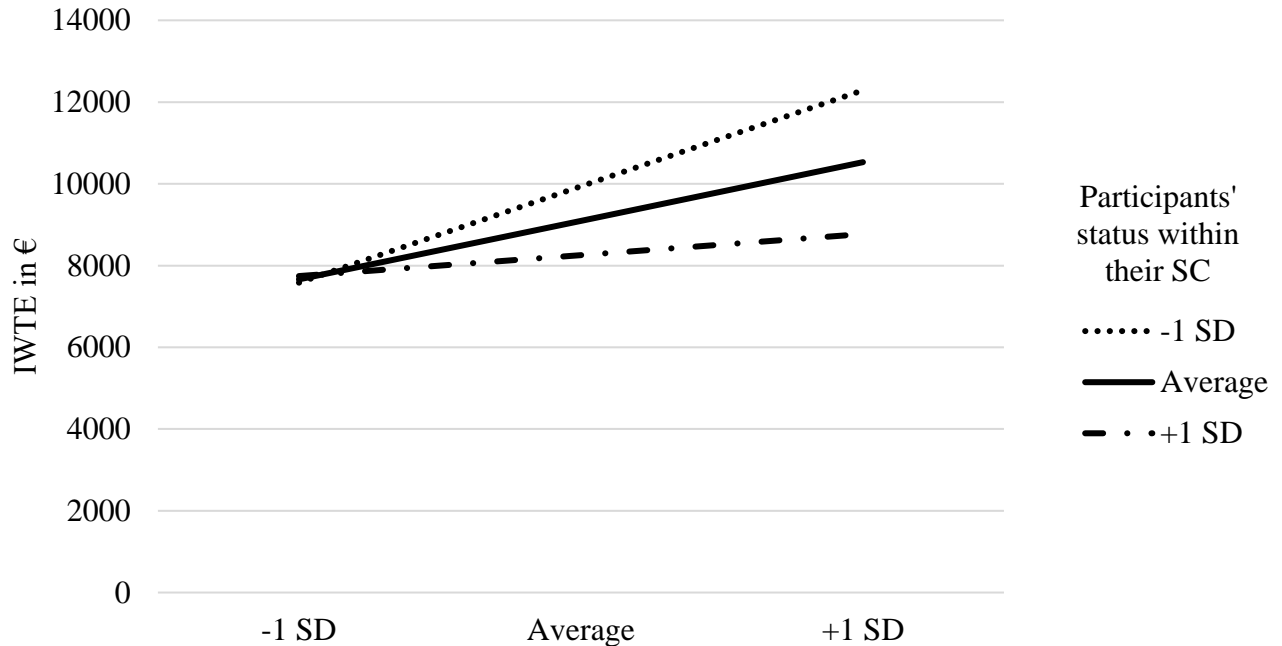
Figure 2.1.
Moderation analysis from Study 2.
Note. Shows participants' IWTE judgment as a function of participants PI and their perceived status within their SCs.

One can see (Figure 2.1) that when participants' PI was high (compared to low) and when they indicate that they have a low status within their SC, their IWTEs were much higher than for participants who indicate a high status within their SC. Furthermore, it seems that individuals with a comparatively low PI did not differ in their estimated IWTE when they indicate a comparatively high or low status. Notably, Model 1 shows no significant interaction between PI and the typical income of the SC and overall, the model fit of Model 1 is worse than that of Model 2. Unfortunately, the present research cannot explain which other factors influence the decision of individuals with a comparatively low PI to make IWTEs. In Study 3, we experimentally test whether comparatively low PI individuals consider their SC perceived status as irrelevant, which might be a reason why these individuals neglected their status, or whether such individuals just do not think about their SC perceived status while making IWTEs.In sum,

these observations are in line with Mussweiler et al. (2004) and not in line with the alternative motivational approach that we discussed at the beginning. The results therefore indicate that people indeed do not perceive themselves as being rich by income, but it does not seem that there is a motivational basis behind this such that people want to avoid being seen as rich. Instead, individuals with a high PI appear to compare themselves to their immediate SCs and lower their IWTE when they perceive that they have a high (compared to low) SC perceived status. Notably, this result is compatible with theorizing and results of Curtis (2013), who argues that individuals tend to perceive themselves being middle class especially when the social environment is equal (compared to inequal). Curtis (2013) argues that individuals in societies with comparably smaller degrees of economic inequality (such as Germany) hold less distinguishing ideologies, that is, identification between 'us' and 'them' among diverse social classes. It may therefore be argued that being wealthy is perceived as 'not normal' which might be a further reason of the positive correlation of the PI and IWTE.

Study 3

The results of Study 2 suggest that Heuristic 3 (social comparison processes between one's subjective standing within ones SC and a person's PI) best explains how comparatively high-income individuals make IWTEs while it seems that low-income individuals mainly rely on their self-generated PI anchor. But why are low-income individuals not affected by their SC perceived status within their SC when they are asked to make IWTEs? It might be that individuals who have a comparatively high PI use different -status dependent- cognitive strategies (i.e., they look at their status to derive WTEs) compared to individuals who have a comparatively low PI, who seem to use a *neglect status strategy* to derive IWTEs. However, there are two possible explanations why people with a rather low PI neglect their SC perceived

status to derive IWTEs. Accordingly, we propose and test the two competing theories on this matter: On the one hand, it may be that low-income individuals simply neglect their relative status within their SC to derive IWTEs because they consider directly experienced conditions in their lives to be more important to make IWTEs than elusive definitions such as "status" (Kraus et al., 2012). Specifically, if this assumption holds true, comparatively lower PI individuals would think that their SC perceived status is irrelevant to make IWTEs. Thus, a (relative) status manipulation would not yield in differences in IWTEs, regardless of whether low-income individuals perceive a high or low relative status. We propose that these individuals would not consider the relative status as relevant for an income wealth threshold definition.

On the other hand, it might also be that some types of information are simply not accessible for comparatively low-income individuals when making IWTEs (i.e., relative social status not coming to mind) because it might be that other information is more salient to set an income wealth threshold. If this assumption holds true, a manipulation of the SC perceived status would be likely to produce differences in IWTEs in comparatively lower income individuals with regard to their SC perceived status because these individuals become aware that their SC perceived status might also be a part of the wealth concept. Importantly, as indicated in the introduction, the perception that one has a low status would yield an IWTE that contrasts away from one's own PI (i.e., a high IWTE, as individuals generally place IWTEs above their PIs), while individuals who perceive that they have a relatively high status would assimilate their IWTE towards their PI (i.e., produce a comparatively lower IWTE).

The Present Study

On basis of this theorizing and in order to replicate the findings for comparatively high-income individuals, in this registered report study, we will manipulate participants' SC perceived status in Study 3 to test the following comparative hypotheses:

If the theoretical account holds true that individuals with a comparatively low PI simply neglect their status because they consider their status as irrelevant to make IWTEs, we should be able to find an interaction between PI and ascribed status on IWTEs. There will be lower differences (lower effect sizes) in IWTEs in individuals with comparatively low PI than in individuals who have a comparatively high PI. In this group of individuals with comparatively low PI, individuals who perceive a low status will indicate that a higher income is necessary to be rich than individuals who perceive a high status.

If, however, the theoretical account holds true that individuals with a comparatively low PI do not spontaneously consider their SC perceived status to make IWTEs, but would be affected by them when one reminds them that status might play a role in making IWTEs, we should be able to find evidence for the following: Individuals with a comparatively high and low income will indicate that more money is needed to be rich when they perceive a low compared to a high status.

Method

Participants

In line with the pre-registration, we collected data from $N = 500$ German participants on Prolific.co, which is a crowdsourcing platform to gather data (see Table 2.1 for demographics). However, $n = 115$ participants had to be excluded due to our pre-registered criteria.

Procedure

To experimentally test our assumptions, we conducted an online experiment. First, we asked participants to indicate their PI as in Study 2 (open ended). Afterwards, participants were randomly assigned to two experimental groups in which their social class was manipulated. The manipulation of social class was carried out in compliance with earlier research (e.g., Piff et al., 2012; Rao et al., 2021). Participants were shown a 10-rung ladder and were asked to imagine that each rung of the ladder represented a specific social class (the rung below represents the lowest class the participant has contact with in their SCs, and the rung on top represents the highest class a participant has contact with). Participants were then asked to imagine someone from their SC who is either on top or at the bottom of the ladder (experimental condition) and next to compare themselves with that person. According to the assumptions of earlier research, a comparison with individuals who are on top of the ladder should lead to a perception of themselves being comparatively low in social class, whereas a comparison with somebody on the bottom of the ladder should lead to the opposite perception of being comparatively high in social class. To strengthen this manipulation, participants were asked to qualitatively describe some differences between the imagined person and themselves with regard to lifestyle, free time and living conditions. Afterwards, participants were again reminded of the PI they had indicated at the beginning, after which they were asked to make an IWTE as in the studies before. After the exclusion of participants who did not meet the exclusion criteria, $N = 385$ participants remained

in the study. Of those, $N = 171$ participants perceived themselves as having a high status versus $N = 214$ who perceived themselves as having a low status.

Data Analyses: Overview

As described in our pre-registration, we used a linear regression. We added sex and age as control variables and the PI, the status condition and an interaction term of PI and status condition as predictors. The IWTE served as criterion variable. We hypothesized that if the interaction term achieves significance, this result will speak in favor of our first assumption that individuals with a comparatively low PI do not spontaneously take their status into account when making IWTEs. We also expected that if the interaction term does not achieve significance but if both main effects are significant, that our second assumption holds true, namely that there might be different cognitive strategies between individuals with comparatively high and low status to make IWTEs.

Results and Discussion of Study 3

The results of the regression analysis showed that neither the main effects nor the interaction achieved significance (see Table 2.10). Thus, in regard to the hypothesis that individuals with a comparatively low PI simply neglect their status when making WTEs because they consider their status irrelevant, the lack of a significant interaction term provided no support. Furthermore, the lack of significant main effects contradicted our theorizing that individuals with a comparatively low PI do not spontaneously consider their SC perceived status to make IWTEs, but would be affected by them when one reminds them that status might play a role in making IWTEs. It thus seems that our hypotheses failed to hold true. However, in light of several sample characteristics we noted after data collection had ended, we conducted additional exploratory analyses.

Table 2.10

Descriptives of the study items in Euro, Study 3

	IWTE	PI	Ladder
M	8,000.52	4,076.96	5.50
SD	5,192.67	14,104.50	1.86
Median	6,000	2,300.00	6.00
Minimum	0	0	1
Maximum	40,000	200,000	9

Note. $N = 385$

Exploratory Analyses

As can be seen in Figure 2.2 and Table 2.11, there are participants who indicated having a PI of more than € 10,000 and even more than € 40,000, which seems very unlikely given the fact that individuals were recruited via a micropayment-driven crowdsourcing platform. Therefore, we carried out exploratory analyses in which we eliminated varying ranges of PIs using a multiverse approach (see the supplement of Study 3). These exploratory results show a range of PI cutoffs (€ 7,500 - € 11,000) in which the interaction term approaches significance (p < .10), including a subset where it achieves significance (€ 9,000 - € 10,000). It is to be expected that the interaction term would become weaker as the cutoff becomes lower even if the interaction hypothesis is in fact true, as the range in which the interaction difference can be expressed is curtailed with lower cutoffs. Thus, these results suggest that a small interaction effect may exist among the population of individuals who report around € 11,000 or less as their monthly PI, for which our study may have been underpowered due to the surprisingly large number of exclusions. The exploratory analyses in the supplements also show that there is no point at which exclusions lead both main effects to achieve significance. In fact, the exclusions do not lead any main effect to achieve significance at all.
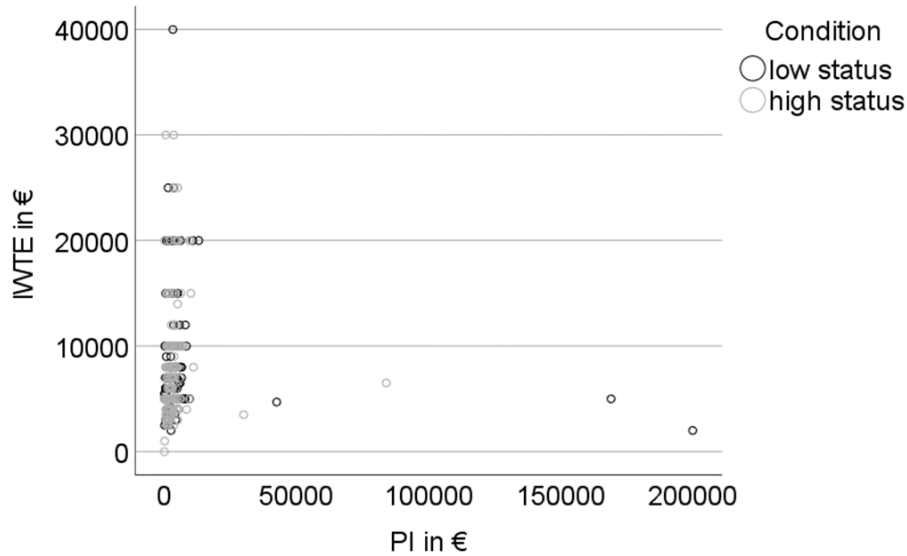
Figure 2.2.

Scatterplot of the results from Study 3
Shows participants' IWTE judgment as a function of participants PI and their manipulated status.

Table 2.11
Intercorrelations of the study items in Study 3

	1	2	3	4
1. IWTE	-			
2. PI	-.04	-		
3. SC Ladder	.02	10*	-	
4. Condition	-.02	-.07	-.15**	-
5. Age	.07	.11	.11*	.04

Note. * $p < .05$, ** $p < .01$; the SC ladder that was used for this correlation questioned where participants would place themselves within their SCs in general

Based on these analyses and the absence of significant main effects, it seems plausible to reject the hypothesis that individuals with a comparatively low PI would use status information to make IWTEs when status information is accessible to them. However, at this point it seems inappropriate to fully reject the alternative hypothesis that individuals with relatively high PIs use social comparisons to generate IWTEs, while low-PI individuals do not. It seems unlikely that individuals who report a PI of more than € 11,000 can be considered to come from the same

population as our remaining sample, especially in light of their extreme leverage as outliers (see Figure 2.2). However, these results do not provide conclusive evidence for the hypothesis, either. While the application of specific cutoff criteria may seem plausible, they still represent post-hoc analyses which may be subject to bias. In addition, the p-values in the multiverse analysis are at best conventionally significant, but do not meet more conservative alpha levels (e.g., $p < .01$).

Notably, in this study, there were also no bivariate correlations with the IWTE question in the preregistered sample (see Table 2.11). This is inconsistent with our previous studies, indicating there might be random responses in the data set. A further exploratory multiverse approach (i.e., excluding single individuals by beginning with the participant with the highest PI) showed that when one excludes participants who indicate a PI that is greater than € 10,000, the bivariate correlation between IWTE and PI remains stable at a $r = .17$ to $r = .19$ level with a p value of smaller than .01, in line with results from our previous studies (see Supplements of Study 3). This further speaks for the assumption that individuals reporting very high PIs provided invalid responses. Interestingly, as in the previous studies, we found that only $n = 25$ (approx. 6%) of the participants indicated to have a household net income that is higher than or equal to their IWTE. This again suggests that "wealth" is more than most people currently have.

In sum, these results appear to contradict the idea that low-PI individuals use social comparisons within their SC when making IWTEs. While the results are not completely inconsistent with the prediction that high-PI individuals do use social comparisons, they provide only inconclusive evidence, indicating that such comparisons may play only a minor incremental role in such estimations for higher-PI individuals.

General Discussion

Our studies aimed to shed light on the question what cognitive mechanisms individuals use when they are asked what income is needed to be rich (IWTEs). To answer this question, one correlative pilot study and two further correlative studies were carried out develop a theory of what mechanisms might be used. Based on earlier research (e.g., Epley et al., 2001, 2006; Mussweiler et al., 2001, 2004) and our own results, we hypothesized that individuals first use their income (PI) as a self-generated anchor into account and "offset" the derived value with an indicator of one's status within one's social circle (SC). However, the experimental support for this theory is inconclusive. Thus, the question arises: what have we learnt from the current study and what are directions for the future?

After conducting this series of studies, we can be certain that people use socially meaningful cues for what is rich and what is not. Our findings indicate that these cues include one's PI, what one thinks others within one's SC earn, and one's subjective status within one's SC. The results of Study 3 suggest that social comparisons play no incremental role above anchoring for low-income individuals but yield inconclusive evidence as to whether high-income individuals adjust their anchor based on their subjective status.

The latter possibility is in line with Duesenberry (1949). He asked people how much money they think would make them and their families happier and more comfortable. He found that as the PI of individuals increases, people want more and more money in percentage terms to be happy. He concludes that high income individuals compete for social status and that they desire to own more and more money to fulfill their desire to strengthen their status. Thus, having both a high PI and high-status places an individual close to being wealthy. But having a high PI and low status might lead individuals to inflate their IWTEs comparatively.

Limitations and Future Directions

There are many limitations of the current studies. First and foremost: Our operationalization of the constructs that we used here are prone to error variance, which is one reason the effect we found may underestimate the true effect size. Specifically, we asked people for their net household income, but some participants in living arrangements that might make responses to this question ambiguous might have wondered how to answer this question, such as those living with housemates. Another limitation is the presence of unexpected outliers in our data. We cannot determine whether the high PI values we observed are valid or result from typing errors. Future research might therefore ask participants to confirm their reported PI before continuing. Relatedly, our sample was recruited from a population likely to be biased towards lower PI, so it is possible that we had too few individuals with high PI to adequately test our hypotheses.

Lastly, our status manipulation may not have been adequate for an online sample. Participants in our study were probably motivated to finish the questionnaire as quick as possible, so it might be that they were only slightly engaged in the questions and manipulation. Future research could therefore incentivize the manipulation, for example by paying monetary bonuses for coming up with multiple individuals of higher or lower status or elaborating on details of the status difference. Alternatively, more immersive manipulations might address this issue; for example, Jetten et al (2015) vividly manipulated status by telling people they would become a member of a virtual society on another planet. Participants could then build their new lives on that planet by building their own homes depending on the status condition they had. Online samples might engage more with this kind of task.

Conclusion

We found that the income of individuals as well as status indicators of others around oneself serve as proxies to estimate an income that is needed to be rich. Furthermore, our studies suggest that individuals' income wealth estimation is almost always higher than what they currently have. However, although we have proposed an idea of how such estimations are made, conclusive evidence for our theory is still missing.

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Chapter 2: Cues of Wealth and the Subjective Perception of Rich People

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Data availability statement

The pre-registrations can be found here:

Study 1: https://doi.org/10.17605/OSF.IO/GP9FA

Study 2: https://doi.org/10.17605/OSF.IO/BCZ6V

Study 3: https://aspredicted.org/um2rb.pdf

Data, material, appendices, and supplements can be found here:

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Conflict of interest disclosure

Compliance with ethical standards and informed consent

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all participants. Study 2 and 3 were ethically approved by the IRB of the Julius-Maximilians-Universität Würzburg (GZEK 2020-26).

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Abstract

These pre-registered studies shed light on the cues that individuals use to identify rich people. In two studies ($N = 598$), we first developed a factor-analytical model that describes the content and the mental structure of 24 wealth cues. A third within-subject study ($N = 89$) then assessed the perception of rich subgroups based on this model of wealth cues. Participants evaluated the extent to which the wealth cues applied to two distinct subgroups of rich people. The results show: German and US-American participants think that one can identify rich people based on the same set of cues which can be grouped along the following dimensions: luxury consumption, expensive hobbies, spontaneous spending, greedy behavior, charismatic behavior, self-presentation, and specific possessions. However, Germans and US-Americans relied on these cues to different degrees to diagnose wealth in others. Moreover, we found evidence for subgroup-specific wealth cue profiles insofar as target individuals who acquired their wealth via internal (e.g., hard work) compared to external means (e.g., lottery winners) were evaluated differently on these wealth cues, presumably because of their perceived differences in valence and competence. Together, this research provides new insights in the cognitive representation of the latent construct of wealth. Practical implications for research on the perception of affluence and implications for political decision makers, are discussed in the last section.

Keywords: Impression formation, The Rich, Subjective wealth cues, Judgement, Implications of wealth

Introduction

'In our western society, a person is rich if he or she buys unnecessarily many new items, is reluctant to go through the hassle of having things repaired, and can afford any luxury, like buying a new car every few years.' This response came from one of our participants after being asked how rich people can be identified. Indeed, this statement is in line with studies that examined how rich people are perceived by others. It has been shown that rich people are rated to possess many assets such as cars, houses, or jewelry (e.g., Bertram-Hümmer et al., 2015; Maaravi & Hameiri, 2019; Ragusa, 2015). Furthermore, the rich are seen as cold but competent (Wu et al., 2018) and they are believed to have a different physical appearance than less affluent people (Bjornsdottir et al., 2017, 2020;). Thus, it seems that individuals believe that the rich are in many ways different from the general population.

Notably, research examining stereotypes about 'the rich' (Christopher et al., 2000; Ragusa, 2015; Wu et al., 2018) suggests that besides few negative stereotypes (e.g., Sarkar et al., 2020), rich people have a generally positive, competent and enviable image (e.g., Cheng & Tracy, 2013). Furthermore, earlier research also investigated how cues of wealth (like cars, houses, etc.), affect the perception and ratings of wealth and rich people in general (e.g., Maaravi & Hameiri; 2019; Bertram Hümmer & Baliki, 2014). It was, for example, shown that individuals can correctly identify the rich based on certain shoes or behaviors (Gillath et al., 2012; Kraus et al., 2009) and that individuals rate certain other possessions as indicative for wealth (e.g., Maaravi & Hameiri, 2019).

What is still missing are studies that deal with wealth cues more broadly, as previous studies have often used only selected wealth cues. This is important since visible cues of wealth represent a starting point for several social-cognitive processes such as stereotype activation and application to form judgments of others. Specifically, social cognition research showed that visible social cues are used by individuals to categorize others into distinct

groups (Macrae & Bodenhausen, 2000). Furthermore, it is assumed that such a categorization process leads to an automatic stereotype activation (Roth et al., 2018), which in turn is often followed by explicit evaluations that drive social behaviors (Macrae & Bodenhausen, 2000). For example, visible cues of wealth make individuals categorize others as rich (Christopher et al., 2000). This categorization into the group of the rich indeed leads individuals to form different impressions of these persons on a variety of social judgment dimensions more or less closely tied to affluence. Accordingly, Christopher & Schlenker (2000) observed that individuals indicated that the rich have different abilities and personality traits than the less wealthy. Among other things, such evaluations of the rich have been shown to be responsible for discrimative behaviors against the rich (e.g., Gino & Pierce, 2010).

The present studies therefore examine the content and the mental structure of cues that individuals utilize to categorize someone as being rich (i.e., wealth cues). Furthermore, it investigates differences between German and US-American participants by exploring whether some cues are more important for German or American participants than other cues in the identification of rich people. Lastly, we investigate whether (competence/valence) stereotypes of two subgroups of rich people (i.e., rich individuals who worked versus did not work for their money, Sarkar et al., 2021) would lead individuals to say that certain wealth cues are more specific for some rich subgroups than for others.

Background

It seems that a collective understanding of the concept 'wealth' is still missing as researchers as well as lay people do not fully agree on how wealth should be defined. Yet it can be differentiated from related constructs such as socioeconomic status (i.e., education, income, etc.), sociometric status (e.g., power, prestige, etc.), social class or dominance (Anderson et al., 2015; Kraus et al., 2012). One problem of attempts to uniformly define wealth is that they are commonly based on either objective or subjective indicators of wealth

(e.g., Götte, 2015). Objective indicators refer to thresholds of objectively measurable goods such as income or assets, whereas subjective definitions take the subjective perception of individuals into account (e.g., stereotypes and feelings) (Gasiorowska, 2014).

The present study builds on the subjective definitions and asks individuals what cues they think are indicative for richness. Brunswik's lens model (Asendorpf, 2018; Brunswik, 1956) is used here as a theoretical basis to describe how individuals derive and use cues to categorize individuals. This model assumes that many traits (such as extraversion or wealth) are not directly perceptible but represent latent constructs that must be inferred from visible cues. Furthermore, the lens model distinguishes between ecologically valid cues and subjectively utilized cues. Ecological validity of a cue is indicated by the factual covariation of a cue (e.g., money) and the criterion (e.g., wealth). Cue utilization, however, is indicated by the covariation of a cue (e.g., an expensive jacket) and subjective estimates of the criterion (e.g., subjective judgments of wealth). Thus, the present research is focused on better understanding the set of subjectively valid cues (i.e., those that people use to infer wealth) instead of ecologically valid cues.

From the perspective of the lens model, utilized cues might actually be ecologically invalid and the usage of ecologically invalid cues might furthermore be explained by a social learning process and the observation that individuals are prone to mis-interpret some social signals (Asendorpf, 2018). An empirical example for dissociations between ecological validity and cue utilization in the realm of wealth is reported by Bjornsdottir and Rule (2017). The authors observed that individuals correctly inferred objective wealth from faces of people with neutral expressions. The ecologically valid cues in this case are subtle expressions of positive affect, which apparently are more prevalent in the faces of rich people. Participants who were asked to evaluate wealth from faces with explicitly happy expressions (a cue that is different from subtle expressions of positive affect), however, failed to identify the

ecologically valid cue. Instead, the authors observed that happy faces were rated rich because individuals' mis-interpreted the happy expressions as an indicator of wealth, independently of their actual social class. Thus, we conclude that individuals' self-reported wealth cues will for the most part be ecologically valid, however, some cues will lack ecological validity but may be used (and reported) nevertheless.

Wealth Cues: The Underlying Structure

The subjective knowledge and underlying cue utilization can be interpreted as being a part of stereotypes about the rich. Social stereotypes contain knowledge about (subjectively) typical features of social groups. Subjective wealth cues exactly fit that description: They represent knowledge about perceivable features of the group of the rich and earlier research suggests that such stereotypes are mentally organized along stereotype dimensions (e.g., Kornadt & Rothermund, 2011; Fiske et al., 2002; Ragusa, 2015). Relevant for the present research, Ragusa (2015) concluded that stereotypes about the rich can be clustered into six categories. He used an exploratory cluster analysis method and found evidence for the following clusters: greedy, materialistic, celebrious, personal traits, commerce, and free enterprise (Ragusa, 2015). Another study systematically examined one specific wealth cue dimension, namely a dimension labeled 'spending implies wealth" (Kappes et al., 2021). It indicates that individuals' belief that rich people are identifiable on basis of their spending behavior. On this basis, we assume that different wealth cues can be mapped to several latent wealth cue dimensions and that these dimensions reflect an overall imagination of how rich people look like.

Previous Research on Wealth Cues

Previous research used wealth cues either as dependent variables (e.g., Garcia et al., 2019; Robeyns et al., 2021) or as independent variables to examine several outcomes that can be assumed to be related to perceptions of wealth but are not these perceptions themselves.

Examples are situational temptations, behaviors related to wealth or the evaluation of others. One study showed for example that the presence of money triggers amoral behavior (Gino & Pierce, 2009). Another study found that individuals are less likely to honk when expensive cars drive below speed limit in front of them (Doob & Gross, 1968). Yet other studies showed that rich individuals are rated to have more favorable personality traits than individuals who do not display such wealth cues (Christopher et al., 2000; Skafte, 1989; Sussman et al., 2014). Thus, wealth cues trigger a variety of behaviors and evaluation processes and the question arises why some cues are perceived as more or less indicative for wealth.

One answer to this question could be that wealth cues are learned by observing the social environment. Indeed, there is evidence that individuals judge wealth on basis of their direct social environment (Galesic et al., 2018), and that individuals would say that different wealth cues are indicative to judge a person as rich, depending on which culture individuals come from. In the western world, for example, one frequently finds that individuals relate wealth to certain lifestyles, clothes, or housing types (e.g., Maaravi & Hameiri, 2019; Jahng, 2019), whereas individuals from Africa indicate that skin color and amount of cattle are cues of wealth (e.g., Bonn et al., 1999). Thus, we argue that it is unrealistic to describe a model of wealth cues that holds true for the entire world population. However, the present research aims at developing a model of wealth cues that might be used in the western world where individuals share similar standards of living.

Advantages of a Newly Developed Wealth Cue Model

The rationale for developing an empirically validated model that describes the underlying structure of wealth cues, was as follows: First, such a model can make future research on the perception of wealth more comparable. For example, some research on wealth cues relied on cars as indicators of affluence (e.g., Maaravi & Hameiri, 2019), while

other research (Skafte, 1989) provided participants with information about target persons'

solvency. Although the researchers' intention behind these distinct operationalizations is to

experimentally vary or measure the same latent construct (wealth), it is likely that different

aspects of wealth become salient based on these different procedures. In the car example,

individuals are likely to think about lifestyle aspects of a rich target, while in the latter

example, individuals would more likely think about investment, shopping habits, or other

financial aspects of wealth. It follows that only very narrow and specific aspects of wealth

were assessed in these individual studies when only some wealth cues were taken into

account. A systematic examination of a comprehensive set of wealth cues and their relation to

each other hence seems preferable to economically map the broad range of wealth cues that

individuals encounter in their daily lives and actually utilitze to infer affluence in others. This

is especially important when researchers or practitioners want to utilize wealth cues to

appropriately represent rich individuals without directly disclosing the bank account of

individuals.

Second, and related to the first argument, the use of a uniform wealth cue model

might help to categorize earlier research on wealth. For example, it was found that rich

(compared to non-rich) people received higher first offers in business negotiations (Maaravi

& Hameiri, 2019) when they displayed wealth through their cars. However, one might

question if this pattern would hold true if other wealth cues were used. A model that captures

the full complexity of wealth cues for the rich could help to check if some wealth cues trigger

different psychological processes than others, to systematize the results, and to generate

theories about the perception of the rich.

Third, we assume that such a model can reveal specific *wealth cue profiles* when it is

used to examine different subgroups of rich people. That is, using a comprehensive wealth

cue model to examine subgroups of rich people could reveal systematic differences between

subgroups in terms of the specific sets of cues that are seen as characteristic for indicating wealth of these groups. For example, individuals might think that some wealth cues (e.g., charismatic appearance) are more indicative for some rich subgroups (e.g., entrepreneurs) than for others (e.g., lottery winners). This proposition will be tested in Study 3.

Study overview

The present research aims at identifying subjective wealth cues and describing the structure (the interrelations) of wealth cues (Pilot Study and Studies 1-2). Furthermore, in Study 2, we aimed to replicate the structure of the wealth cue model for participants from Germany and the USA. Lastly, Study 3 tests the practical usefulness of the developed model by testing whether individuals ascribe different wealth cues to two different subgroups of the rich. We hypothesize that individuals have different stereotypes about competence and valence of these rich subgroups which leads to different evaluations. Based on this assumption, we predict different wealth cue profiles of these rich subgroups.

The structure of the studies is as follows: In a Pilot Study, we identify wealth cues by asking participants qualitatively via an open answer format for their opinion, what cues they use to identify rich people. Importantly, wealth cues were not predefined by us, but participants were asked to generate subjectively valid cues through free association (i.e., qualitatively). Building on these wealth cues, Study 1 then examines the underlying structure of latent factors behind these wealth cues via an exploratory factor analysis (EFA). In Study 2 we validate the factor structure identified in Study 1 by means of a confirmatory factor analysis (CFA). In this study, we also validate the model for participants from Germany and the USA. Importantly, in these studies, we do not specify any group of rich people in particular but ask for the group of the rich more generally to develop a model that can be applied more broadly. The rationale is that we assume that the content and the structure of such a model is applicable for many rich subgroups although the agreement to certain wealth cues might be

higher for some rich subgroups than for others (see Study 3). All analyses were conducted with SPSS 25 and SPSS AMOS 25. Studies 1-3 were pre-registered[2].

Pilot Study

To generate wealth cues, $N = 86$ psychology students of a German university ($M_{age} = 20.73$, $SD = 2.31$; $n = 69$ female) were asked to write two sentences in response to each of the following questions: 'How would you know someone is rich?', 'What does a person need to have in order to be recognized as rich?' and 'What kind of lifestyle do you need to be recognizable as rich?' (See Appendix A in the supplements).

We obtained 516 wealth cue replies using this method. One answer was for example: 'You can tell when someone is not paying attention to his or her budget when he or she goes shopping'. Next, we summarized similar responses into distinct categories and re-formulated the resulting sentences into a standardized format so that the sentences can be clearly understood and in a manner that it is possible for people to directly recognize the cues. Summarizing was done by grouping conceptually similar items according to the abstract category they had in common. For example, cues referring to brand-name shoes or brand-name jackets were grouped into one category labelled 'expensive clothing'. Most of the resulting wealth cues read as follows: 'If a person shows/is/has/likes… it is a sign s/he is rich' or 'A rich person is…'. One example wealth cue after editing is: 'If a person goes shopping for fun several times a month (e.g., for clothes, jewelry), it is a sign that s/he is rich'. In a last step, two experts discussed each item for its applicability for the next study. In sum, a list of 67 unique wealth cues emerged.

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[2] Study 1: https://doi.org/10.17605/OSF.IO/GP9FA, Study 2: https://doi.org/10.17605/OSF.IO/BCZ6V, Study 3: https://aspredicted.org/um2rb.pdf, Data, material, appendices, and supplements be found here: https://doi.org/10.17605/OSF.IO/A7HC9

Study 1

The Pilot Study qualitatively identified wealth cues. Study 1 uses an EFA approach to examine the underlying factorial structure of these wealth cues. We refer to the emerging factors as *wealth cue dimensions*. We first aim to develop an exploratory model that describes the content and the structure of the single cues for the group of the rich which shall be confirmatorily replicated in Study 2. The EFA was chosen to derive a broad but parsimonious model (in terms of number of items) to describe cues that are subjectively related to rich people.

Method

Participants

Two hundred German Amazon mTurkers took part in this online study ($n = 40$ female). The sample size corresponds approximately to a one-item-three-participants' ratio. Around 59% of the participants were between 18 and 29 years old and 28% were between 30 and 39 years old. The remaining sample was younger than 20 years old (7%) or older than 40 years (15%).

Procedure

To assess whether individuals would indicate that rich individuals are identifiable based on the 67 wealth cues, we employed the following instruction: 'Below you are presented with sentences that contain statements about how you can tell or recognize that a person is rich. Please rate to what extent you agree with the following statements using the scale from 1 = 'do not agree at all'; 7 = 'strongly agree'. Lastly, participants provided demographic information (sex, age, and household net income).

Results

The procedure that we used for the EFA approach was similar to Rinn et al. (2019). Three items did not meet the criteria of normal distribution (item identifier: AF34, AF38,

AF39). These items had skewness and/or kurtosis outside the acceptable range of ±2 and were removed from further analyses. The remaining 64 items were internally consistent (Cronbach's α = .95) and omitting individual items would not have improved internal consistency. Thus, we kept all items for the further analyses. Next, the Kaiser-Meyer-Olkin test and the Bartlett test of sphericity showed that the data were suitable for an EFA (KMO = .87; Bartlett: χ^2 [2016] = 7412.22, $p < .001$). Visual inspection of the scree-plot suggested that approximately four factors were meaningful to interpret and Velicer's MAP test indicated that four to seven factors were meaningful to interpret. Thus, to avoid using the Kaiser criterion, as suggested by Howard (2016) and to derive as many factors as possible, we moved on by forcing SPSS to derive a seven-factor solution at the beginning.

EFA results and a preliminary CFA

We used a maximum likelihood method with a promax rotation, beginning with a seven-factor solution. We then removed six items due to small communalities (<.30), however left two items due to theoretical reasons (these items were reported elsewhere), so we decided to keep them for the next rotation. The next rotation yielded several items that had double loadings, that is items that load on a different factor with a factor loading of >= .30. We removed 11 items with double loadings. Due to theoretical reasons, we did not remove two items with double loadings (i.e., we assumed that they might be able to load on emerging factors in the next analysis). We proceeded with the next rotation and again removed eight items due to double loadings. We then reduced the number of factors to first 6, and after an unsatisfactory final solution, to 5 in order to get a neat factor solution. In the next analysis we again removed five items due to double loadings. We did not remove one item because we again assumed that it might be able to load on emerging factors in the next analysis. After the next analysis, we removed 3 items with double loadings and kept one item because we assumed that they might be able to load on emerging factors in the next analysis.

After the next rotation, we found a clear five factor structure. Howard (2016) recommended to rotate the last solution again which however, again yielded double loadings. We removed these items and reduced the factors to four. This solution yielded the final factor solution that was rotated again (see Appendix B in the supplements).

Because first, Factors 1 and 2 had more than twice as many items than Factors 3 and 4, and second, because from a theoretical point of view they seemed to be splitable, we ran separate EFAs for each of these factors to derive sub-factors with fewer items Appendix C (in the supplements) shows the solution of the EFA procedures. As can be seen there, Factor 1 was split into three and Factor 2 was split into two sub-factors. We labelled Factor 1 'high spending willingness'. This factor comprised the sub-dimensions: 'luxury consumption' (Factor 1a); 'expensive hobbies' (Factor 1b); 'spontaneous spending' (Factor 1c). Factor 2, 'character' comprised the wealth dimension 'greedy behavior' (Factor 2a), which contains visible cues such miserliness or that someone does not like to pay for meals for others. Furthermore, the 'charismatic behavior' dimension (Factor 2b) comprises visible cues such as charismatic or extraverted behaviors. Lastly, we labelled Factor 3 'self-presentation' because within factor rich people are described as presenting themselves with status symbols, and we labelled Factor 4 'possessions' because this factor describes that rich people are believed to possess certain material objects.

We decided to apply a CFA to the same dataset as the one we used to build our model for two reasons. Following van Prooijen and van der Kloot (2001), follow-up CFA's are recommended as a first assessment of whether a model built based on an EFA approach is worth to be validated with a new sample. The aspired generalizability might be compromised (a) because the decision criteria used to extract factors might have been too liberal; (b) because we constructed a higher order structure of the data that cannot be tested via conventional EFA approaches. We used a ML higher order CFA approach. This three-layered

structure (see Figure 3.1) was supposed to represent the common latent construct of the

above-described factors, the Factors 1-4 identified in the EFA, and (3) the sub-factors

identified for Factors 1 and 2. These factors (Factor 1; 1a, 1b, 1c; Factor 2: 2a, 2b; Factor 3

and Factor 4) were modelled as latent variables because we assumed underlying (latent)

constructs described by the indicators (i.e., our wealth cue items). In this model, the error

terms of AF41 and AF13, AF21 and AF50; AF28 and AF53, AF28 and AF01 and AF14 and

AF12 were correlated because of similar wording and a somehow overlapping content. Also

note that one item (AF24) was removed from the model due to poor factor loading.
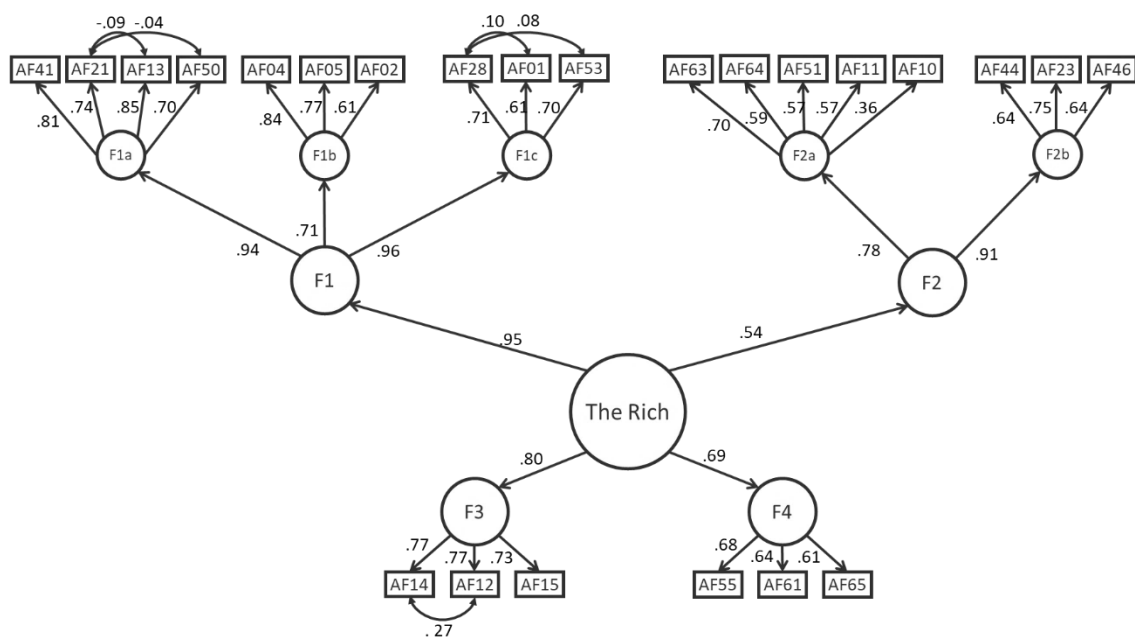
Figure 3.1
CFA model from Study 1.
Note. All paths were significant at the *p* < .001 level. The error terms were not significantly correlated (all *p*s > .07). Factor explanation: F1: 'high spending willingness'. F1a: 'luxury consumption'; F1b: 'expensive hobbies'; F1c: 'spontaneous spending'; F2: 'character'; F2a: greedy behavior'; F2b: 'charismatic behavior'; F3: 'self-presentation'; F4: 'possessions´

In sum, the model fit (χ^2[238] = 378.66; p < .001; SRMR = .06; CFI = .92; RMSEA = .05) meets the threshold for acceptable fit that was also used in previous research (e.g., Lai et al., 2016). Particularly notable is the fact that the three-layered model had a better model fit than a two-layered model (χ^2[243] = 471.38; p < .001; SRMR = .07; CFI = .87; RMSEA = .07) that was suggested by the results of the EFA without splitting. This supports the appropriateness of splitting Factor 1 and Factor 2 in the way we have described above. Table 3.1 shows the descriptives and Table 3.2 shows the intercorrelations of the final factors. Descriptively, the factors with the highest means are the factors 'expensive hobbies' (M = 5.13, SD = 1.23) and 'possessions' (M = 4.49, SD = 1.10) while the agreement with the character dimensions 'greedy behavior' (M = 3.19, SD = 1.11) and 'charismatic behavior' (M = 2.33, SD = 1.21) is less strong.

Table 3.1
Descriptives of the wealth cue dimensions from Study 1

Factors	Number of items	M(SD)	Min	Max	Skewness	Kurtosis
1. High spending willingness						
a. Luxury consumption	4	3.97 (1.36)	1.00	7.00	-019	-0.62
b. Expensive hobbies	3	5.13 (1.23)	1.00	7.00	-0.78	0.26
c. Spontaneous spending	3	3.51 (1.38)	1.00	7.00	0.13	-0.66
2. Character						
a. Greedy behavior	5	3.19 (1.11)	1.00	6.60	0.21	-0.19
b. Charismatic behavior	3	2.33 (1.21)	1.00	7.00	1.24	1.90
3. Self-presentation	3	3.77 (1.36)	1.00	7.00	-0.15	-0.70
4. Possession	3	4.94 (1.10)	1.33	7.00	-0.51	0.07

Note. N = 200.

Table 3.2
Intercorrelations of the wealth cue dimensions from Study 1

	1	*1a*	**1b**	**1c**	**2**	**2a**	**2b**	**3**
1. High spending willingness	-							
a. Luxury consumption	*.88***	-						
b. Expensive hobbies	*.80***	.56**	-					
c. Spontaneous spending	*.87***	.69**	.50**	-				
2. Character	.37**	.34**	.17*	.41**	-			
a. Greedy behavior	.32**	.29**	.16*	.35**	*.87***	-		
b. Charismatic behavior	.33**	.32**	.14	.37**	*.89***	.56**	-	
3. Self-presentation	.61**	.58**	.45**	.52**	.29**	.29**	.30**	-
4. Possession	.52**	.48**	.42**	.42**	.27**	.27**	.24**	.36**

Note. $N = 200$. **$p < .01$, *$p < .05$; italicized correlations represent the correlations between the sub-factors with their respective higher order factor.

Discussion

Study 1 provides novel insights regarding the content and the structure of wealth cues. It is noteworthy that some of our wealth cue dimensions share some characteristics with stereotypes of rich people. For example, Ragusa (2015) asked participants to provide stereotypes about rich people and found evidence for a stereotype content similar to our character dimension (greedy behavior; Factor 2a) and possession (Factor 4) dimension. However, in contrast to Ragusa (2015), we asked participants which characteristics they thought would be required to recognize someone as being rich, by which we forced participants to produce cues that are visible from outside. Thus, the character dimension that we described above was not only a non-visible feeling or stereotype of rich people but was summarized from explicitly named cues that are used to recognize rich people.

Notably, the greedy behavior dimension shares similarities with the theoretical conceptualization of greed described by Lambie et al. (2019). The authors describe greed as a desire for money, insatiability to gain more, a retention motive, and an excessive desire for more possessions. These characteristics are all present within the greedy behavior dimension

that we found, which shows that the greedy behavior dimension as described in our wealth dimension has a good construct validity.

Importantly, the content and structure of our wealth cue dimensions included some aspects that were not identified in previous research, for example the 'character' wealth cue dimension 'charismatic behavior' (Factor 2a), which shows that rich people are believed to be able to attract others. Another wealth dimension, self-presentation (Factor 3), reflects the notion that people showing off their possessions or costly free-time activities in social media are likely to be perceived as rich. A further wealth dimension is the 'high willingness to spend' (Factor 1), with three sub dimensions wealth that also reflect how a rich person is believed to be recognized by the population. That is, it seems that individuals believe that people who have a high willingness to spend money (Factor 1) or to spontaneously spend money (Factor 1c) for hobbies (Factor 1b) and for luxuries (Factor 1a) are rich. Most interestingly, the wealth dimension 'possessions' has the highest agreement that the containing wealth cues signal wealth. Even though these wealth cue dimensions are intuitively not surprising, they are only rarely examined in previous research (e.g., Kappes et al., 2021) and our model offers a first insight about the mental organization of wealth cues.

Although we acknowledge that there is a debate about the validity and usability of various fit indices, (i.e., which one is to report and how various fit indices play together, what happens when two indices disagree, e.g., Lai et al., 2016), we conclude that the model we reported showed an acceptable fit. Regarding the wealth cue agreement, we interpret the results as follows: In the Pilot Study, all single cues were semantically produced such that they can be used to recognize rich people, which justifies that the wealth cues can be referred to as subjectively valid wealth cues. However, when individuals are asked to rate how accurate they are, it seems that some perform better than others. Most participants agree that expensive hobbies are a valid cue to recognize affluence, whereas the charismatic behavior

and greed behavior cues are less valid, yet not unusable, indicators of wealth. That is, the descriptives (maxima and standard deviations) indicate that there are some individuals who agree that people who display these cues can be described wealthy. Thus, we assume that our model is suitable to map which cues people perceive as subjectively valid. The following study aimed to validate the structure of the model developed in Study 1.

Study 2

Study 1 provided first evidence for a latent wealth cue construct. However, Study 1 was an exploratory approach that we used to build a theoretical model and we used the same data set to carry out EFAs and a CFA. In the present study we address these concerns and aim to validate the factorial structure that we found in Study 1 by replicating the model. Furthermore, as argued before, it is likely that the validity of wealth cues differs across cultures (e.g., Bonn et al., 1999; Wu et al., 2018), but since individuals form their impression of wealth on the basis of other people around them (Galesic et al., 2018), we assume that the model that we presented in Study 1 would appropriately explain the content and the structure of wealth cues in the western world. If this assumption holds true, we should find an acceptable model fit for individuals from two western cultures that share a similar standard of living such as Germany and the USA. The two countries are described as being individualistic, similarly masculine, and similar in the power distance domain (Hofstede et al., 2010). However, it may well be that individuals from two culturally similar countries have a different wealth concept in mind which we are also going to test in this study.

Method

Participants

In sum, $N = 398$ ($n = 195$ American, $n = 203$ German) participants took part in an online study via www.prolific.co. The sample size corresponds to a sixteen participants-per-

item ratio overall. In this study, $n = 172$ participants were female ($n = 220$ male)[3] and 46% of

the participants were between 20 and 29, 25% were between 30 and 39 and 12% were

between 40 and 50 years old.

Material and Procedure

The procedure was the same as in Study 1. This time, we collected data about the 24

items that remained after the EFA in Study 1. Furthermore, to use the items in the USA, a

native speaker translated the items to English, and we translated them back to German. We

then checked if the wording and the meaning of these back-translated items matched the

original and corrected the English versions accordingly if they did not. Additionally, to check

if the mean scores of each dimension matched the subjective importance of each dimension to

recognize rich people, we asked participants to rank the dimensions using a flashcard method.

That is, we provided participants with seven virtual flashcards with the names of each

dimension as a heading and the descriptions below. The ranking order placed the most

important element atop, that is, the first rank was given to the most important dimension to

recognize someone as rich, seventh rank was assigned to the least important dimension.

Results

In line with the pre-registration, we examined whether the model developed in Study 1

could be replicated for German and US-American participants. Results indicated first an

acceptable model fit overall participants ($\chi^2[238] = 737.29$, $p < .001$, SRMR $= .07$; CFI $= .91$;

RMSEA $= .07$). Splitting the samples by country (see Figure 3.2) showed that both models

had an acceptable fit. The model fit for the German sample was $\chi^2(216) = 445.79$, $p < .001$,

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[3] Because there was considerable variability in the studies regarding the sex ratio, we
report separate analyses that take sex differences into account in Appendix D in the
supplements. Results from a MANOVA show that there were no sex differences in the
subjective importance of the wealth cues in Study 1. However, in Study 2, there were sex
differences regarding the character dimension: Greedy behavior and charismatic behavior
were more important for males than females to identify a rich person.

SRMR = .08; CFI > .90; RMSEA = .07, and for the American sample was $\chi^2(216) = 589.72$, *p*

< .001, SRMR = .07; CFI > .90; RMSEA = .09. This validates our assumption that the content

and the structure of the models is similar for two western countries.
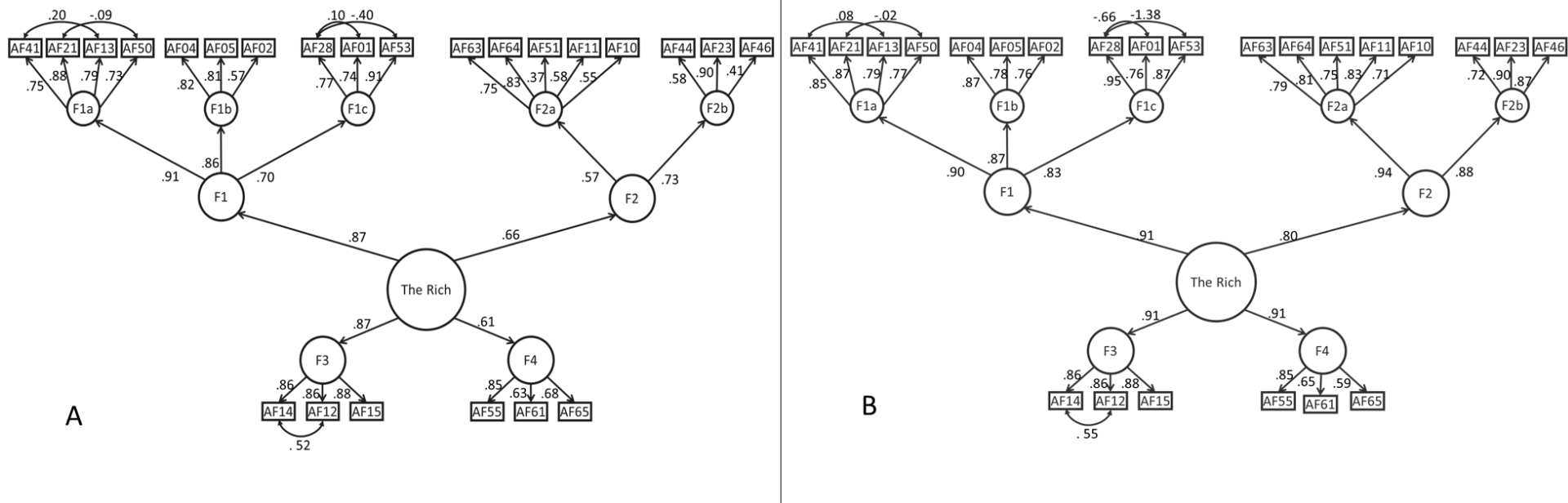
Figure 3.2

Results of the CFA in Study 2

Note. Figure 3A shows the model for the German sample. In the German sample, the following error terms were significantly correlated: AF41 and AF13 (B = .213, SE = .103, p = .038), and AF28 and AF01 (N = -.278, SE = .183, $p < .001$). No other error terms were significantly correlated in the German sample (all ps > .128). Figure 3B shows the model for the American sample. The following error terms were significantly correlated in the American sample: AF28 and AF53 (B = -.632, SE = .206, p = .002), AF14 and AF12 (B = .511, SE = .13, $p < .001$), and AF28 and AF01 (B = -.436, SE = .201, p = .030). In the American sample, no other error terms were significantly correlated (all ps > .445).

To test whether individuals from both countries have a similar wealth cue concept in mind (i.e., whether the model is measurement invariant), we conducted a factorial invariance analysis and tested for metric invariance (Crowson, 2020). Results indicated that the χ^2 difference between the more and the less restrictive models was significant $\chi^2(23) = 69.8$, $p < .001$. This indicates that the measurements are not measurement invariant.

The by-country descriptive statistics for the aggregated dimensions are displayed in Table 3.3, and the intercorrelations averaged over all participants are displayed in Table 3.4. The descriptives for the single items in Studies 1 and 2 can be found in Appendix E (in the supplements). Furthermore, exploratory analyses examining whether individuals from the two countries differ in their agreement that the wealth cues can be used to identify rich people can be found in Appendix F in the supplements.

Table 3.3

Study 2 Descriptives for the wealth cue dimensions for the German and US-American samples

	M (*SD*)	Flashcard ranking position	Minimum	Maximum	Skewness	Kurtosis	Cronbach's α
1. High spending willingness							
1a. Luxury consumption	3.86/4.32 (1.38/1.56)	3/2	1.00/1.00	7.00/7.00	-0.24/-0.25	-0.57/-0.67	.87/.89
1b. Expensive hobbies	5.46/5.15 (1.12/1.36)	1/1	1.00/1.00	7.00/7.00	-1.38/-1.14	3.08/1.10	.76/.84
1c. Spontaneous spending	3.63/3.86 (1.43/1.58)	4/4	1.00/1.00	7.00/7.00	-0.14/-0.14	-0.57/-0.81	.82/.84
2. Character							
2a. Greedy behavior	2.93/3.19 (1.09/1.48)	6/6	1.00/1.00	6.20/7.00	0.27/0.65	-0.31/-0.13	.74/.88
2b. Charismatic behavior	2.35/2.97 (1.00/1.54)	7/7	1.00/1.00	5.00/7.00	0.37/0.65	-0.76/-0.34	.67/.87
3. Self-presentation	3.33/3.70 (1.48/1.76)	5/5	1.00/1.00	7.00/7.00	0.15/0.14	-0.83/-1.06	.90/.92
4. Possession	4.92/4.61 (1.18/1.42)	2/3	1.33/1.00	7.00/7.00	-0.60/-0.52	0.00/-0.16	.71/.67

Note. N = 398

Briefly, on average, the agreement to the factors 'expensive hobbies' and 'possessions' was descriptively higher than for the character sub-factors 'greedy behavior' and 'charismatic behavior'. The intercorrelations show that all dimensions and sub-dimensions were significantly related to each other with at least a medium effect size (see Table 3.4). Notably, the rank order of the average dimension scores matched the flashcard ranking (see Table 3.3). That is, participants ranked 'expensive hobbies' first, and this dimension also had the highest average score. The dimension 'charismatic behavior' was ranked last, and the average agreement score was lowest.

Table 3.4
Intercorrelations of the wealth cue dimensions from Study 2

	1	1a	1b	1c	2	2a	2b	3
1. High spending willingness	-							
a. Luxury consumption	*.67***	-						
b. Expensive hobbies	*.90***	.83**	-					
c. Spontaneous spending	*.65***	.55**	.86**	-				
2. Character	.37**	.33**	.45**	.47**	-			
a. Greedy behavior	.43**	.33**	.49**	.51**	*.90***	-		
b. Charismatic behavior	.40**	.26**	.43**	.44**	*.61***	.90**	-	
3. Self-presentation	.61**	.58**	.68**	.58**	.49**	.55**	.50**	-
4. Possession	.42**	.62**	.56**	.43**	.49**	.49**	.39**	.52**

Note. N = 398. **p < .01, *p < .05; italicized correlations represent the correlations between the sub-factors and their respective higher-order factor.

Discussion

These results replicated the wealth cue model and indicate the existence of a latent wealth construct that might represent an overall image of how rich people look like – not only for the German but also for the American sample. We thus found evidence for the assumption that two countries that are similar on many cultural dimensions (Hofstede et al., 2010) share a similar mental structure of wealth cues. Notably however, although the structure of wealth

cues was similar for participants from both countries, results from a factorial invariance analysis suggested that individuals from both countries differ regarding the underlying wealth cue concept. This suggests that there is a certain degree of context dependency in the perception of richness on the basis of wealth cues that is influenced by culture.

The finding that the flashcard ranking matched the scores of the Likert-scale ratings has two important implications for the present research: First, it showed that the wealth cues can be ranked in their subjective agreement with different measurement methods. This speaks for a high reliability of the wealth cue dimensions. Second, it showed that although we collected data on a crowdsourcing platform, the data quality was good. Participants conscientiously dealt with the questionnaire and took it seriously.

Study 3

In the previous studies, we found evidence for wealth cue dimensions that describe how individuals identify rich people. The following study aims to demonstrate the usefulness of the newly developed model by examining the extent to which different rich subgroups are perceived differently. In particular, we want to find out whether the model, which aims to capture the wealth cues of rich individuals as a whole, would potentially be able to capture rich subgroups as well. We argue that this is important because earlier research showed that the rich are not a homogenous group, but they are rather a diverse group with several subgroups. For example, there are different subgroups of rich people that differ in how they acquired their wealth.

Evidence suggests that individuals evaluate the rich differently depending on whether they acquired their wealth through their own efforts (internal means) or by chance or luck (external means) (Kirby, 1999; Sussman et al., 2014; Wu et al., 2018; Zitelmann, 2020). Rich people who acquired their wealth via internal means (e.g., entrepreneurs or CEOs) are rated to have more positive personality traits than individuals who acquired their wealth through

external means (e.g., lottery winners or heirs; Sussman et al., 2014; Wu et al., 2018).

Furthermore, rich people who acquired their wealth via internal means are seen as being more

competent (Wu et al., 2018) and are evaluated more positively (Kirby, 1999; Zitelmann,

2020) than people who acquired their wealth via external means. The latter are typically seen

as being lavish and lazy (Kaplan, 1987).

This line of research suggests that there are at least two (non-orthogonal) stereotype

dimensions (competence and valence) that capture the essence of why rich subgroups are

perceived differently. In Study 3, we hypothesized that these competence/valence stereotypes

would make different wealth cue dimensions salient[4]. Specifically, we hypothesized that

different subgroups of the rich are characterized by different wealth cue dimensions. If there

are indeed systematic differences in what wealth cues individuals attribute to rich individuals

of different subgroups of the rich, then it should be possible to identify subgroup-specific

wealth cue profiles.

To examine this, we assumed the following: By forming an impression about others,

people tend to categorize individuals as being a member of a specific social group and check

if these individuals have certain characteristics that are typical of the group (e.g., Macrae &

Bodenhausen, 2000). For subgroups of rich people, it was found that people who got rich via

internal means were perceived more positively, more likeable (Kirby, 1999; Sussman et al.,

2014) and more competent (Sussman et al., 2014; Wu et al., 2018) than individuals who

acquired their wealth via external means. Thus, these characteristics go along with

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[4] Note that for the present research we assumed that valence is a different attribute
than the warmth construct that was described in the Stereotype Content Model (Fiske et al.,
2002). Although warmth and (positive) valence might be partly overlapping, in this research
valence refers to behaviors that can be viewed as positive or negative. For example, a person
can build a company on their own, which is considered as positive and competent, but not
warm. Hence, valence and competence can be related to each other and therefore represent
non-orthogonal constructs.

individuals who earned their money through their own work. Accordingly, it can be assumed that participants rate wealth cues that reflect competence as being predictive of somebody's membership in the rich subgroup of persons who acquired their wealth via external (compared to internal) means. Analogously, wealth cues that signal negative (compared to positive) valence should be more predictive of someone belonging to the group of persons who acquired their wealth externally (compared to internally).

We expected that the seven wealth cue dimensions from Study 2 are differentially important for recognizing 'internally' versus 'externally' rich. The first dimension is 'high spending willingness' and can be further split up into the three wealth cues 'luxury consumption', 'expensive hobbies', and 'spontaneous spending'. Thus, it seems that individuals attribute wasteful spending to the overall group of rich people. Compared to this, individuals with internal wealth sources are seen as competent because they worked hard for their status and wealth (Sussman et al., 2014, Wu et al., 2018). Additionally, being frugal might be seen as a skill that is helpful in accumulating wealth. So, persons who acquired their wealth by internal means should be rated as being more competent in dealing with money than people with external wealth sources. Hence, people with internal wealth sources should be assigned greater thrift, and consequently rated lower than people with external wealth sources on the dimension 'high spending willingness' (H1). This is analogously true for the three wealth cue dimensions (Hypothesis 1a [H1a]: luxury consumption; H1b: expensive hobbies; H1c: spontaneous spending).

The second dimension is 'character' and involves the two wealth cue dimensions 'greedy behavior' (negative valence) and 'charismatic behavior' (positive valence). According to the valence levels, we expected people with internal wealth sources to be rated lower concerning 'greedy behavior' compared to people with external wealth sources (H2a) and higher concerning 'charismatic behavior' (H2b).

Another wealth cue dimension is 'self-presentation'. Since self-presentation has positive (e.g., brave) as well as negative (showing off) aspects, we did not assign it clear positive or negative valence (the items appeared neutral in valence). Hence, we had no hypothesis about the agreement with the wealth cues summarized in this dimension. The items of the self-presentation dimension are also formulated rather neutrally regarding the competence dimension. Therefore, we refrained from positing a specific hypothesis on how internal vs. external means of wealth acquisition would affect self-presentation ratings. The corresponding analysis should be treated as exploratory.

For the last wealth cue dimension, 'possessions', there was also no clear valence, nor did it clearly indicate competence or the opposite thereof. As both individuals with internal wealth sources and those with external wealth sources would typically fulfill the requirement of having the kind of money to attain possessions, we expected comparable ratings for both groups on this dimension (H3). Thus, the confidence interval of the mean comparison for 'possessions' should include 0 and the associated p-value of the t-test should exceed $p = .100$.

Method

Participants

We collected data from a convenience sample ($N = 100$ Germans, , $n = 11$ had to be excluded due to pre-registered criteria) online ($n = 63$ female). Participants were on average $M = 29.52$ years old ($SD = 12.44$). Many participants were students ($n = 63$).

Material and Procedure

In this within-subjects experimental design, participants were shown four vignettes. Two of them described people who acquired their wealth via internal means (i.e., a CEO and an entrepreneur) and two of them described people who acquired their wealth via external means (i.e., an heir and a lottery winner). Source of wealth (internal vs. external means) is the independent variable. The vignettes were shown in a randomized order and were inspired by

a previous study (Sussman et al., 2014) but they have been translated into German and adapted for improved comprehensibility. The vignettes were pre-tested to show that people who acquired their wealth internally (compared to externally) were perceived as being more competent ($N = 124$; $F[1,123] = 1122.76$, $p < .001$, $\eta_{part}^2 = .90$).

The dependent variables were the scale values on the dimensions that we reformulated to test our hypotheses (see above). We instructed participants to indicate whether they would agree that the person in each vignette displays the characteristics described in the wealth cues, on a scale from 1 (do not agree at all) to 7 (fully agree). One example from the luxury consumption wealth cue is 'this person always wears the latest fashion'[5].

Since we assumed that people who acquired their wealth via internal would be rated as more positive than those rich by external means, we asked participants to evaluate the likeability of the four rich persons using the following question: 'You have now 'met' four different people. If you had to spend an evening with one of the four people described, which one would you choose?'. We further collected demographic variables and for exploratory purposes a German version of a just world belief scale (not reported here).

Results

We first calculated mean scores for each wealth dimension. We then averaged mean scores for each dimension across the two vignettes that described individuals with internal versus external wealth sources. To test our hypotheses H1-H3, we conducted a 7 (wealth dimension) X 2 (source of wealth) repeated measurement ANOVA. Results (see Figure 3.3) showed significant main effects of both wealth cues ($F[6,528] = 41.76$, $p < .001$, $\eta_{part}^2 = .32$) and source of wealth ($F[1,528] = 43.07$, $p < .001$, $\eta_{part}^2 = .33$). Most importantly, however,

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[5] Due to technical difficulties, we only collected two of three items of the wealth cue 'possessions'. AF65 was not collected.

the interaction between the wealth cues and wealth source was significant ($F[6,528] = 48.36$, $p < .001$, $\eta_{part}^2 = .35$). Simple slope analyses via paired-sample t-tests showed that, as predicted, individuals who acquired their wealth via internal means, compared to those with external means, were rated as engaging in less luxury consumption (H1a, $t[88] = -6.06$, $p < .001$, $d = -0.64$) and as having fewer expensive hobbies (H1b, $t[88] = -5.99$, $p < .001$, $d = -0.63$). Furthermore, they were seen as less likely to spontaneously spend money (H1c, $t[88] = -9.86$, $p < .001$, $d = -1.05$), less greedy behavior (H2a, $t[88] = -4.45$, $p < .001$, $d = -0.47$), and more charismatic behavior (H2b, $t[88] = 5.46$, $p < .001$, $d = 0.58$). The exploration showed that people who acquired their wealth via internal (vs. external) means were perceived as engaging in less self-presentation ($t[88] = -6.74$, $p < .001$, $d = -0.72$). Furthermore, we unexpectedly found that they were perceived as having more possessions than people who acquired their wealth via external means (H3, $t[88] = 4.54$, $p < .001$, $d = 0.48$).
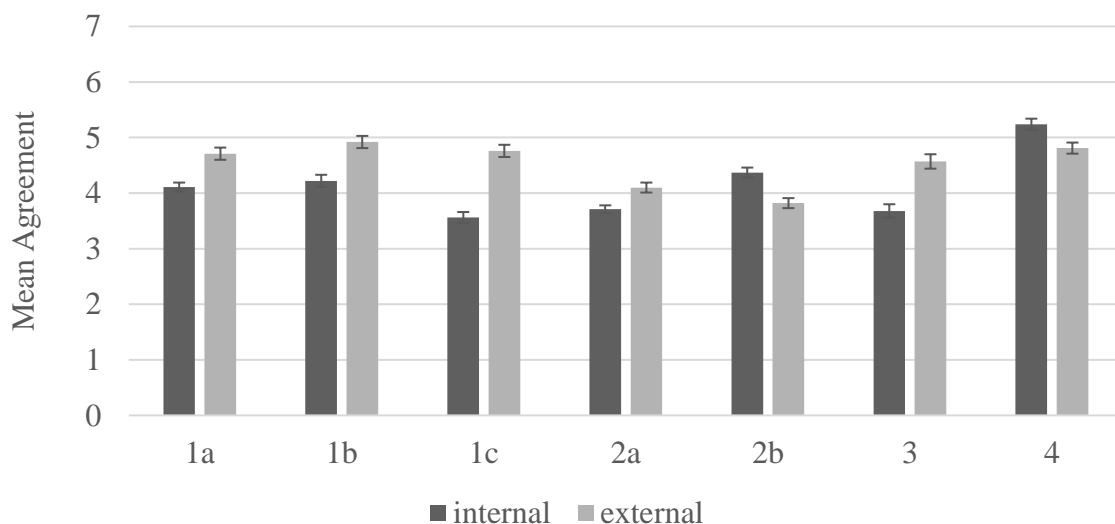
Figure 3.3
Study 3: Average ratings of the wealth cue dimensions for people who acquired their wealth via internal (e.g., hard work) and external means (e.g., luck).
Note. $N = 89$; the error-bars represent the standard errors of the means.

Validating previous findings (Kirby, 1999), a chi-square test shows, as predicted, that participants would rather spend time with people who acquired their wealth via internal than via external means, $\chi^2(1) = 38.44$, $p < .001$. Results showed that $n = 81$ participants would

rather spend time with the CEO ($n = 26$), or the entrepreneur ($n = 55$) compared to $n = 19$ who would spend time with the lottery winner ($n = 12$) or the heir ($n = 7$), which speaks for the assumption that the former were perceived as being more positive in valence than the latter.

Lastly, we test intra-class correlations among the vignettes by testing whether participants rated the wealth cues similarly depending on the source of wealth that was described in the vignettes. The intra-class correlations can be rated as average with ICC = .502 in the condition where the target person earned their wealth by hard work and ICC = .521 in the condition where the target person earned their wealth by external means. Thus, the vignettes were somewhat similar but also produced inter-individual variance.

Discussion

Study 3 tested whether wealth cues related to competence and valence of rich subgroups are distinctly predictive for individuals who acquired their wealth via internal means (e.g., a CEO) compared to external means (i.e., a lottery winner) which leads to specific wealth cue profiles. As predicted, wealth cue dimensions associated with lower competence (like a high generalized willingness to spend) were perceived as more descriptive of people who acquired their wealth via external means. We assume that a common belief is that it is unlikely that individuals can get rich via internal means only when they display a certain degree of competence or in simpler terms: incompetent people cannot get rich by their own effort. This complements Horwitz and Dovidio (2017) who stated that an important aspect of the perception of the rich is the legitimacy of their wealth.

On the other hand, people who acquired their wealth via internal means were perceived more positively, that is, they were more likeable and had higher ratings in charismatic behavior, than target persons who acquired their wealth through external means. This fits the assumption of Langer (1975) who noted that individual's belief that 'good things

happen to people who do good things, and bad things happen to people who do bad things' (Langer, 1975, p. 312). This reasoning and our empirical findings align with prior research on stereotypes about different subgroups of the social category of the rich that show that individuals who earned their wealth via internal (compared to external) mean are evaluated more positively (Sussman et al., 2014; Wu et al., 2018).

Regarding our exploratory finding, we found that participants evaluated the target persons who acquired their wealth via external (compared to internal) means to have a higher engagement in self-presenting behavior. Since people who acquired their wealth via external means are perceived more negatively than the other group, it might be that despite the neutral wording of the items, this dimension is perceived negatively as bragging behavior. This would explain why the more positively rated people with internal wealth sources were rated lower on this dimension compared to those with external wealth sources.

An explanation for the unexpected result concerning the 'possessions' dimension (H4) it could be that although the items included in this dimension were neutrally formulated (in terms of valence), the items were perceived to contain a positive connotation as they depict desirable objects. Accordingly, the rich prototype with internal wealth sources was rated more positively and higher on the 'possessions' items than the person with external wealth sources. Furthermore, the single wealth cues could be taken to indicate competence to some extent (e.g., caring about a healthy lifestyle and taking care of finances). This could be associated more strongly with the internal wealth source prototype, which was generally perceived as more competent. Taken together, this study confirmed that the evaluation of the relative importance of different wealth cue dimensions for recognizing somebody as rich was at least partly based on stereotypes about distinct subgroups of rich people (Wu et al., 2018).

General Discussion

We examined the content and the structure of wealth cues, which are a part of the rich stereotype. So far, research has either asked participants to reproduce stereotypes about the rich without focusing on visible cues (e.g., Ragusa, 2015) or made a pre-selection of wealth cues (e.g., Bertram Hümmer et al., 2015). But it remained unclear if these approaches appropriately reflect the full range of wealth cues and how these cues can be structured to aptly describe the mental representation of the latent wealth construct. Our work addressed this gap in the literature. We systematically studied wealth cues generated by participants through free association, rather than predefined attributes that qualify a person as rich. Our studies thereby added important novel insights to our understanding of the range of attributes taken to indicate wealth, and how these wealth cues are organized to form one complex cognitive representation of the social category of the rich.

First, regarding the content, the present research revealed subjective wealth cues that were rarely studied so far. To our knowledge, there are no studies that examined the role of charismatic behavior and only few that examined greedy behavior in the subjective perception of wealth in other people. One reason might be that traits in general are hard to observe and to operationalize. Greedy behavior might be overlooked, possibly because stereotypes about the rich are mainly positive (Christopher et al., 2000; Ragusa, 2015). Furthermore, we are also not aware of any study that examined the role of wasteful behavior in rich people, as indicated by the spontaneous spending dimension. Although there is one recent study that developed a 'spending implies wealth belief scale' (Kappes et al., 2021), our spontaneous spending dimension is more differentiated as it contains three sub-dimensions that are more specific about what individuals shall spend their money on to be identifiable as rich. Thus, contrary to earlier studies (e.g., Bertram-Hümmer & Baliki, 2015; Kappes et al., 2021; Ragusa, 2015), our research provides a validated model of various wealth cues.

Our wealth cue model also shows some parallels with earlier research regarding the content. We confirmed the prior findings that rich people are recognized by specific possessions (e.g., Bertram Hümmer et al., 2015; Ragusa, 2015). Moreover, we observed that individuals ascribed a high spending willingness (luxury consumption, expensive hobbies) to the rich, which is somewhat in line with what Maaravi and Hameiri (2019) have found in their examination of the influence of wealth cues (e.g., cars) on first offers in business negotiations. Based on their findings that wealth cues go along with high first offers, it may be concluded that individuals believe that rich people are more willing to spend than people who do not show such cues. In addition, our results further showed that rich people are also thought to have different looks because they present themselves with different symbols compared to people who are not rich (Gillath et al., 2012). And although some wealth cue dimensions do not appear to be new, or intuitively surprising, the present results allow a broader understanding of their meaning (i.e., their content) and yield possible operationalizations of the wealth cue dimensions.

Regarding the structure, our wealth cue model indicates that wealth cues cluster around latent dimensions just like stereotypes of the rich and other subgroups of the society do (Kornadt & Rothermund, 2011; Ragusa, 2015). Furthermore, the results indicate an overall latent factor that may reflect how individuals imagine how a rich person looks like. This is in line with the assumption that several directly observable cues combined serve as a lens through which it is possible to infer an underlying latent construct of wealth (Asendorpf, 2018; Brunswik, 1956). Notably however, results from a factorial invariance analysis show that although the structure of wealth cues is similar for participants in Germany and the USA, it seems that the abstract concept of what is typical for a rich person differs in both countries. We speculate that the different wealth concepts stem from different observations of conspicuous consumption behavior of rich people in Germany and the USA.

Regarding the wealth cue profiles, we found that some wealth cues are more indicative for people who acquired their wealth via internal compared to external means than other wealth cues. So far, studies that examined these subgroups of the rich (e.g., Sussman et al., 2014; Wu et al., 2018) have only investigated the likeability of those rich groups (Sussman et al., 2014), for example with the use of stereotypes from the stereotype content model (Sakar et al., 2021; Wu et al., 2018). In contrast to this, Study 3 revealed that people relate specific behaviors and use different wealth cues to identify these rich subgroups, because the subgroups are seen as differently competent and likeable. The results revealed that wealth cues can be distinguished in their perceived valence and competence which shows that the developed wealth cues have a good predictive validity.

Limitations

The wealth cues that were generated in the Pilot Study stem from students and two experts in this research area. It is thereby possible that there could be further relevant wealth cues that were not covered through our sample and could in the future be included by asking participants from other classes of society. Moreover, our research is likely to be subject to cultural dependency (Bonn et al., 1999) because wealth cues might differ across cultures (especially within the 'possessions' domain), meaning that depending on the cultural background, different cues are believed to indicate that a person is rich. Furthermore, this study relied on semantic descriptions of participants and what cues they use to identify rich people. Research has shown that individuals, however, can identify affluence based on non-verbal cues that did not show up in the verbal descriptions of the participants (such as positive affect, Bjornsdottir & Rule, 2017). Thus, it seems that there are cues that are hard to verbalize but that still are used to identify the rich.

Directions for future research

Our studies provide a broader understanding of the content and the structure of wealth cues. Future research might examine whether the wealth cues that we identified here are ecologically valid cues of rich people. Brunswik's (1956) lens model might be a framework for such research. Furthermore, we found that although the wealth cue structure was similar among two countries that share a similar living standard, there were systematic differences regarding the relative importance of individual cues. This prompts further cross-cultural research regarding the perception of wealthy people.

Furthermore, Maaravi and Hameiri (2019) showed that individuals received higher first offers in business negotiations when they were perceived being rich. Given the insights from our studies, there is now a set of cues that are related to rich people that goes beyond money and single indicators of wealth (or status), such as cars or leather-bound books. It may be an interesting avenue for future research to experimentally manipulate these wealth cues to check which of them are most important for certain behaviors related to wealthy people.

Implications

The findings of our studies are relevant for theories on the perception of wealth since they suggest that wealth cues are not 'absolute'. That is, people differ to some extent regarding what wealth cues they deem to be indicative of richness (see e.g., the results of the pilot study), the country of origin seems to make a difference in what kind of wealth cue concept people have in mind, and wealth cues differ depending on what subgroups of rich people individuals think of. Thus, the stereotype activation and the subsequent judgement of others is not only subject to visible cues but also the context in which these cues are presented (Macrae & Bodenhausen, 2000).

The findings of our studies are also of practical relevance. One major implication for individuals working as legal decision makers (e.g., political decision makers or judges) is the

following: Earlier research has shown that wealth triggers social expectations (e.g., Götte, 2015). Since wealth cues might be used to categorize someone being rich, individuals who display such cues are admired by others as they are also perceived as competent (Wu, et al., 2018) and assumed to have desirable personality traits (Christopher et al., 2000; Leckelt et al., 2019) that lead to great social advantages. A recent paper for example, reports on a court case in the USA which involved two comparable crimes (two juveniles who drove drunk and killed pedestrians) (Weiner & Laurent, 2021). One of the two cases was committed by a poor person and the other was committed by a rich person. In both cases, the attorneys used the same defense strategy. Notably, however, the rich defendant was sentenced to only 10 years' probation whereas the poor defendant was sentenced to 20 years' imprisonment. It seems as if the presence (or absence) of wealth cues leads to certain decisions that are at risk to turn out to be unfair probably because judges ascribe more positive personality traits to rich individuals than to poorer ones. We therefore recommend that individuals who work in legal decision-making contexts should be aware of the existence of such social class stereotypes and try to counteract against them to not be at risk to make unfair decisions.

For researchers who aim to examine the perception of wealthy people, the model that we developed indicates what cues individuals use to identify rich people. Thus, there is now a set of replicated wealth cues that might help to categorize earlier research. Furthermore, these wealth cues might serve as dependent variables in future studies like we used them in our Study 3, or to measure perceived wealth without directly asking individuals how much money this person earns or how rich they are.

There are also implications for the legislative branch. As outlined above, there is no uniform definition of wealth and research demonstrates that individuals form their impression of wealth and probably wealth cues based on other people around them (Galesic et al. 2018). Thus, debates (e.g., about whom to tax) are prone to be influenced by individuals with whom

a person interacts on a regular basis and not by uniform definitions. When addressing, for instance, tax or social security reform, legislators should clearly define who the rich are before they start to talk about them. Otherwise, it is likely that they disadvantage certain social classes because they base their reasoning on their own experiences or on wealth cues that might be perceived differently depending on one's own social standing.

Summary and Conclusion

Although wealth is an important topic that even the ancient philosophers already dealt with, it is relatively understudied in psychology. Understanding the perception of wealth, however, is important since our (political) attitudes and behaviors are heavily influenced by perceptual and social cognition processes. The present research provides a new model of wealth cues that are subjectively related to the rich in two western societies. Between these culturally similar countries, wealth cues may differ in their subjective validity to indicate affluence but not in terms of their underlying structure and relation to the latent construct of wealth. In addition, the findings showed that subgroups of rich people are characterized by different wealth cue profiles, presumably because individuals have different stereotypes about these groups.

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Chapter 3: Greedy Behavior in the Mental Representation of 'the Rich'. A Reverse Correlation Study

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Compliance with ethical standards and informed consent

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. All participants received an appropriate informed consent. The studies were ethically approved by the IRB of the Würzburg University (GZ2020-26).

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This chapter is original and has not been previously published in an academic journal.

Abstract

Previous evidence shows that while wealth is more likely to be associated with positive than negative facial images, greedy behavior is also attributed to the rich. Little is known; however, about how greedy behaviors are expressed through facial images and whether facial images expressing greedy behaviors are more likely to be associated with the rich. To address this research gap, we first constructed facial images expressing three characteristics (positivity, neutrality and greedy behaviors) using the reverse correlation technique ($N = 182$). These images were then shown in two experiments to ($N = 331$) participants who rated the images' greedy behavior, valence, and richness. Although greedy behavior was attributed to the generated greedy face from the preparatory study, it was at the same time rated as less rich than the remaining faces. We discuss the differential pattern of associative links between richness and greedy behavior regarding the semantic versus the visual mental representation.

Keywords. Reverse correlation; greed; the rich; social class; face evaluation; behavior trait evaluations

Introduction

Throughout our life, we encounter innumerable other people and quickly form impressions about them which then guide subsequent interaction. Sometimes, our impressions are based on verbal or semantic information (Busching & Lutz, 2016; Dotsch et al., 2013; Oliveira et al., 2019a; 2019b; Rinn et al., 2020). At other times, we may simply rely on physical appearance; that is, on visually processed information (Agthe et al., 2011; Maaravi et al., 2011; Maaravi & Hameiri, 2019; Niesta Kayser & Schwarz, 2017; Oh et al., 2020). Because another person's sex, age, and ethnicity are usually visible, they are often called basic social categories suggesting that visual cues play a major role in impression formation. One so far relatively understudied domain of social categorization based on visual cues is social class and in particular richness (Rinn et al., 2022). For instance, another person's affluence can be partly inferred from external cues such as expensive clothes or jewerly (e.g., Ahl et al., 2019; Bertram Hümmer et al., 2014; Rateau, 2015; Rinn et al., 2022). Other visual cues, such as typical emotional expressions of 'the rich', may be more subtle (Bjornsdottir & Rule, 2017, 2020) but also influence how we behave against others which is also known as classism or social class bias (Rickett et al, 2022). These subtle cues are at the center of the current research addressing the questions whether visual attributes of the rich are consistent with semantic representations. Specifically, we look at the relationship between the visual representation of rich peoples' faces (that we assessed in a preparatory study) and the semantic attributes that are associated with them.

Semantic Mental Representation of 'the Rich'

Most stereotypical features ascribed to rich people are positive such as being intelligent or likeable (Horwitz et al., 2014; Horwitz & Dovidio, 2017; Leckelt et al., 2019). Yet, there are also stereotypical attributes about rich people that are at least ambivalent, if not even clearly negative

in valence such as being cold or greedy (Durante et al., 2017; Ragusa, 2015; Wu et al., 2018).

Other studies report that the rich are also seen as being selfish, aggressive, or immoral (Kocak,

2015). Notably, some aspects of stereotypes about 'the rich' in fact correspond with their own

self-views (Leckelt et al., 2019). For example, both positive personality traits (e.g., a high locus

of control) and negative traits (e.g., dominance or narcissism) occur in the self-perception of rich

people as well as in their perception by others (Leckelt et al., 2019). Similarly, non-rich as well as

rich individuals perceive the rich as privileged and entitled (Cheng & Tracy, 2013; Ding et al.,

2017).

One characteristic that goes beyond positivity and which is often semantically encoded to

be present in rich people is greedy behavior (e.g., Parker, 2012; Ragusa, 2015; Rinn et al., 2022;

Zitelmann, 2020). Research indicates that there is some validity to the common belief that the

more you have, the more you want (Wang, et al., 2019). In addition, because greed leads to a

malignant, insatiable desire to acquire more (material) resources, it is most likely to be perceived

as negative and maybe even dangerous by others (Lambie et al., 2019). In fact, Christianity

counts greed as one of the seven deadly sins. At the same time, however, greed also has some

positive facets. People are, for example, aware that greed is an adaptive trait which leads to

positive economic outcomes such as economic growth of the individual (Wang & Murnighan,

2009; see Lambie & Haugen, 2019 for a review). It might therefore be that individuals hold the

belief that the positive outcome of greedy behavior (successful resource acquisition) makes

individuals happy. Furthermore, individuals are also aware that greedy behavior is a factor for

economic growth of the society (Wang & Murnighan, 2009; Lambie & Haugen, 2019). Thus,

although greedy behavior is most likely viewed negative, there is still the possibility that the

mental representation of greedy behavior has some positive aspects.

The Visual Representation of 'the Rich'

Physical cues often play an important role in inferring others' characteristics. It remains unclear, however, whether complex and ambivalent concepts such as greedy behavior can be easily read from simple physical characteristics. In general, rich individuals may lead their lives habitually in certain ways which eventually shape their facial features. For example, it has been argued that whereas lower social class individuals frequently have to defend themselves against external threats, people in higher classes have more opportunities and the freedom to do as they wish (Kraus et al., 2012). Accordingly, it was assumed that these experiences promote the well-being of individuals from higher (compared to lower) social class (Bjornsdottir & Rule, 2017; Diener & Biswas Diener, 2001). As a consequence, higher class individuals should tend to smile more frequently, which in turn might be visible for others (either directly, or indirectly for instance through laugh lines). Bjornsdottir and Rule (2017) showed accordingly that the rich look more positive than poorer people's faces, even when instructed to make a neutral facial expression. Indeed, the authors provided evidence for inferring social class from facial images. As predicted, neutrally posed rich (as compared to poor) targets displayed for example more positive affect and more signs of physical attractiveness. Perceivers used this information as a basis for categorizing their social class (Bjornsdottir & Rule, 2017, 2020). Furthermore, another finding indirectly supports this proposition: When target persons were instructed to pose a facial expression with positive affect, participants were no longer able to accurately decode the pictures of the target persons into different social classes. The authors conclude that only facial cues that are positive in valence (attractive, healthy, positive, etc.) are utilized to guess that someone is rich (Bjornsdottir & Rule 2017). However, as argued before, greedy behavior is also a part of the semantic representation of rich people. Hence, one of the central questions that we aim to answer

is whether faces that contain the impressions of greedy behaviors are also more likely categorized as being rich.

There is strong support that the mental representation of rich people includes mainly, though not exclusively positive features (Bjornsdottir & Rule, 2017, 2020; Rateau, 2015; Rinn et al., 2022). Yet, our review of the pertinent literature also pointed to a noticeable difference between the semantic and visual cues of richness. Regarding the visual cues, previous research indicates a strong association of wealth and positivity, as outlined above. In contrast to that, semantic cues contain also at least ambivalent cues of wealth such as greedy behavior (e.g., Ragusa, 2015; Rinn et al., 2022; Zitelmann, 2020). However, although many traits have been shown to have at least somewhat specific facial representations (such as dominance or friendliness, e.g., Oliveira, et al., 2019b), to the best of our knowledge, no study has investigated how greedy behaviors might be visually represented. If there is such a phenomenon as a specific look of greedy behavior, the subsequent question would be whether the non-positive visual cues underlying this look might be used by others to classify a target person as being rich. Such a finding would challenge the conclusion drawn from previous research (Bjornsdottir & Rule, 2017; 2020) that richness is inferred from exclusively positive facial cues.

We therefore assume that if individuals decide that greedy behavior has positive facets, then the mental representation of faces that display greedy behaviors may also have positive visual characteristics. One reason for that might be that individuals who behave greedy are seen to have competitive advantages in life (Lambie & Haugen, 2019; Wang & Murnighan, 2009). If this was the case, then facial images expressing greedy behaviors would prompt positive cues to said expression due to the subjective positivity−richness association (Bjornsdottir & Rule, 2017).

If, however, negative aspects of greedy behaviors are more salient to individuals, the mental representation of greedy behaviors in faces may have predominantly negative characteristics. As a consequence, a visualization of that mental representation should *not* be decoded rich by other individuals. In fact, earlier research has shown that pictures of faces with negative affect are rated rather poor than rich (Bjornsdottir & Rule, 2019).

Finally, yet another possibility is the following: It might also be that greedy behaviors are mentally represented in a negative fashion. Still, due to the greed-wealth association it might be that a visualization of greed leads to the attribution of richness. Such a finding would contradict the notion of a universal wealth−positivity link (Bjornsdottir & Rule, 2017) for faces. The present research aims to clarify which of these theoretical accounts holds true by using the reverse correlation task.

Using the Reverse Correlation Task

In order to bring these assumptions to an empirical test and to generate stimuli that reflect individual's mental representations of greedy behavior, positive and neutral faces, we used the reverse correlation paradigm (Brinkman et al., 2017). Researchers have used this technique to visualize the mental representation of specific stereotypes (e.g., foreigners, Dotsch et al., 2008), social categories (e.g., manager and nursery teachers; Imhoff et al., 2013), behavioral descriptions (e.g., Dotsch et al., 2013) and even complex descriptions including more than one feature at the same time (e.g., being cold and competent, Oliveira et al., 2019a). Within the reverse correlation task to be used in the current study, participants will be asked to make a series of binary decisions, always about two pictures of the same target person at a time (i.e., they will see one person with varying noise filters). These images will be manipulated with a random noise filter so that the person on each picture looks different. For example, in a given trial, one of two

depicted faces might look a bit happier than the other one. Depending on the condition, participants can be asked in a binary choice task to decide which of the two images presented looked more like a pre-defined set of descriptions or behaviors. At the end, all chosen pictures are merged into one single classification image (CI) and all pictures that were not chosen are merged into a single anti-classification image (anti-CI) accordingly.

The Present Research

The current study investigates whether (and if so, to what extent) only positive faces are used to evaluate someone as being rich, or whether alternatively a face that displays greedy behavior will also be associated with wealth. Further, it seeks to understand whether faces that display greedy behaviors evoke a positive impression in others (in line with an understanding of greed as instrumental for achieving wealth and success) or a negative one (in line with a negative moral judgment of greedy behaviors). Before starting with the preparatory study, we pre-registered the studies including the sample size on aspredicted.com and osf.io where also the used materials, data and supplements can be found[6]. Pre-registration was generally adhered to (with a few exceptions which will be outlined). In line with Simmons et al. (2012) "we report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study" (Simmon et al., 2012, p. 1). Furthermore, data collection was not continued after data analysis. The analyses were conducted using SPSS 25 for the inference statistics. Throughout the manuscript, we report η^2 (not η_{part}^2) effect sizes for the analyses of variance that we calculated using the spreadsheet that was provided by Lakens (2013). Furthermore, we report Cohens *d*

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[6] Pre-registration of the preparatory study and Study 1 can be found here: https://doi.org/10.17605/OSF.IO/FHYTX; the Pre-registration of Study 2 can be found here: https://doi.org/10.17605/OSF.IO/RNCBJ; and the data, material, appendices, and supplements can be found here: https://doi.org/10.17605/OSF.IO/FR5T7

effect sizes that were calculated on Psychometrica (Lenhard & Lenhard, 2016). Participants were

recruited on Prolific.co (the preparatory Study, 1 and 2) and were German native speakers. We

received an ethical approval from the IRB of the University of Wuerzburg (GZEK 2020-26 and

GZEK 2021-22). All participants agreed to an appropriate informed consent and a data protection

declaration prior to the studies. The data collection took part with the use of SoSci Survey

(Leiner, 2019).

Preparatory Study

The preparatory study was conducted to create visual images of a positive, a neutral and a

face that display greedy behaviors with the use of the reverse correlation paradigm (Brinkman et

al., 2017). To do so, $N = 182$ participants (34% female; with approximately $n = 60$ participants

per condition) took part in this study. A larger sample size (i.e., ten more participants) was

sought, relative to the pre-registration, to further enhance the quality of the CIs. Participants were

on average $M = 29.8$ ($SD = 9.73$) years old. In two unrelated studies, individuals were first asked

to answer questions about their demographics and then they were asked to rate their semantic

representation of the rich (Rinn et al., 2022). Afterwards, participants read the instructions and

proceeded with the reverse correlation task.

Procedure and Resulting CIs

For the reverse correlation paradigm, we drew a single face image from the Radboud Faces

Database (Langner et al., 2010) which was then manipulated with a random sinusoid noise filter.

We randomly assigned participants to one of three conditions and asked them to always chose the

face that looked either more positive, neutral, or greedy, respectively. For a total of 300 binary

choice trials, participants were asked to always choose the picture that looked or behaves either

more positive, neutral, or greedy to them, depending on the between-subjects condition to which

the participants were randomly assigned. Since social representations contain a figurative core (Rateau et al., 2012) and to create a vivid imagination in individuals how these characteristics look like, we provided several characteristics, traits, and/or behaviors that have been shown to depict positivity (Bjornsdottir & Rule, 2017), greedy behavior (Rinn et al., 2022), and neutrality. Thus, the purpose was to extract an image which is an overall representation of a face containing these characteristics. This way we created one CI with a face that contains the mental representation of neutral characteristics, one CI with positive-, and one CI with greedy behaviors that were associated with rich people in a previous study. Note that the participants were not instructed to think of rich or poor targets. With this first step, we aimed at visualizing the mental representations of greedy behaviors (as well as positive and negative) looking faces.

In the positive condition, participants were asked to always chose the image to which the following descriptions would apply more strongly: 'is in a positive emotional mood', 'has a high level of well-being', 'is physically attractive' and 'is diligent'.

In the neutral condition we asked participants to imagine a person who has a 'neutral facial expression', is in a 'neutral mood' and who 'has no strong emotions'.

Finally, in the greedy behavior condition, participants were asked to imagine a person who is 'miserly', who 'does not like paying for meals for others', 'has a lot of free time', 'has a reckless lifestyle' and 'who would like to increase their money'. Those cues/behaviors were semantically produced with an open answer format by participants in a previous study to describe rich people (Rinn et al., 2022). Because of this and the fact that those cues were congruent or at least related to definitions of greed that were proposed by previous research (e.g., Lambie & Haugen, 2019), it was assumed that these cues appropriately reflected the construct of greedy behaviors, and that greedy behaviors was indeed used as a subjective valid cue to identify the

wealth of others.

At the end, all chosen pictures were merged into one single classification image (CI) for each condition (i.e., positive, neutral, and greedy behavior) and all those not chosen were merged into one single anti-classification image (anti-CI) accordingly. The stimulus material for the reverse correlation task were created with the rcicr package in R (Brinkman et al., 2017; R Core Team, 2020).

The resulting CIs and anti-CIs of the three conditions can be found in Figure 4.1. To check whether participants had a similar mental representation in all three conditions in mind, we calculated the inter-rater correlation of the ratings of the participants (i.e., whether participants chose the same picture in each condition). The inter-rater reliability was very good to excellent with .86 in the positive condition, .91 in the neutral condition and .90 in the greedy behavior condition, indicating that participants chose similar pictures in the positive, neutral and greedy behavior condition respectively.
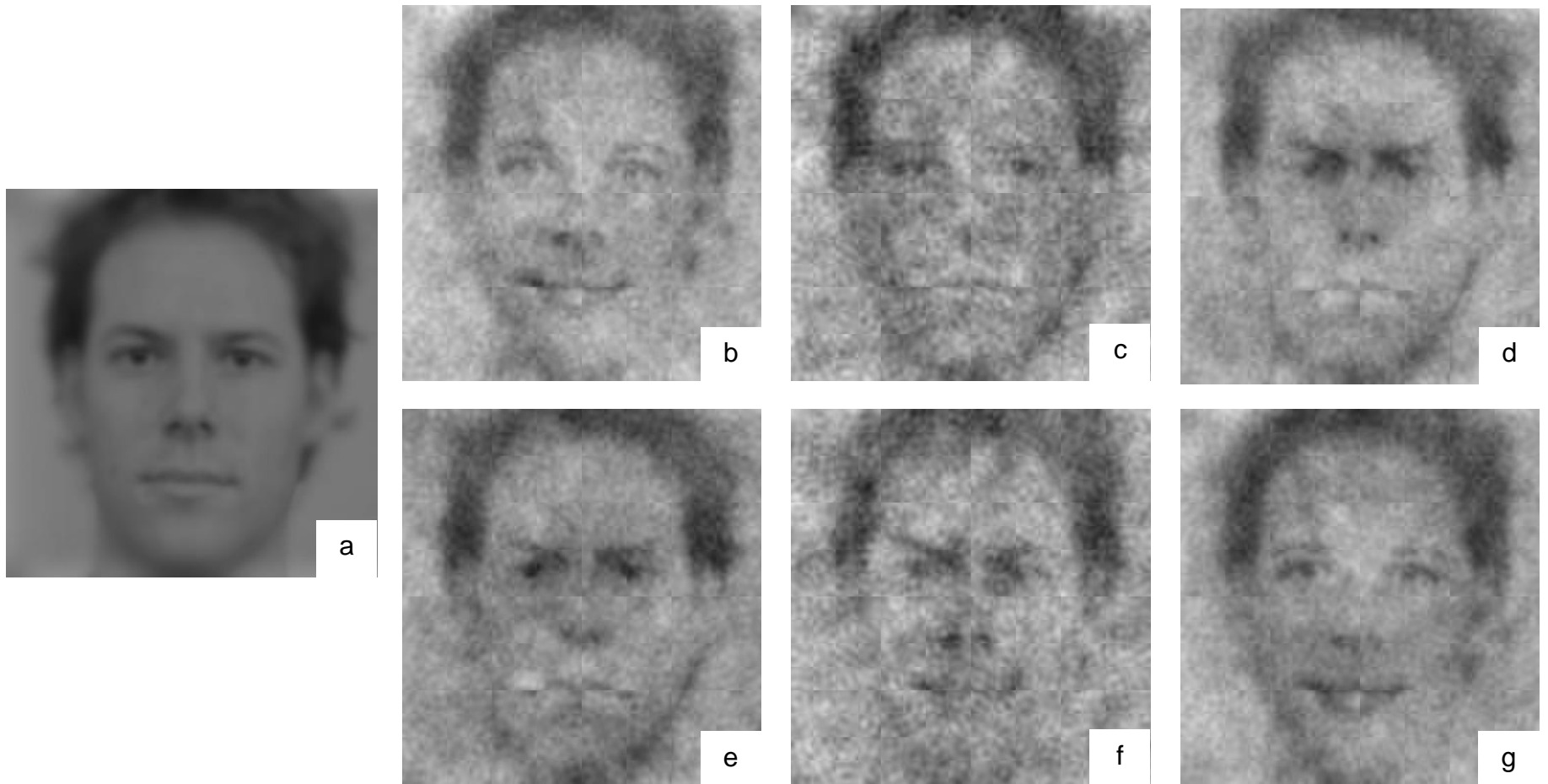
Figure 4.1.

Stimulus material used in Study 1: CIs from the preparatory study.

Note. a. Base image, b. $CI_{positive}$, c. $CI_{neutral}$, d. CI_{greedy}, e. anti-$CI_{positive}$, f. anti-$CI_{neutral}$, g. anti-CI_{greedy}.

Study 1

Recall that we aimed at studying whether only positive faces - compared to a neutral face – are rated to be rich, or whether alternatively a face that contains the impression of greedy behaviors will also lead to the attribution of wealth. To do so, we asked participants in Study 1 to rate the applicability of positive and negative traits to the CIs and anti-CIs and to rate the richness of the depicted persons. By doing so, we aimed at deciding which of the theoretical accounts outlined above is more valid. Thus, our pre-registered operational hypotheses derived from these competing accounts were as follows:

Hypothesis 1a: Participants are more likely to attribute positive traits to the CIs expressing positivity and greedy behaviors, relative to the CI expressing neutrality. Furthermore, participants will rate individuals displayed on images from the positivity and the greedy behaviors condition as being wealthier than the persons displayed in the images from the neutral condition.

Hypothesis 1b: Participants will attribute positive traits more strongly to the visualized mental representation of the positive condition than to that of the greedy behavior- and the neutral condition. Furthermore, they will also attribute a higher degree of richness to the images of the positive than the greedy behavior and neutral condition. Thus, the richness attribution to the visualized mental representation of the positive condition should be higher than to that of the greedy behavior and the neutral condition.

Since so far it is unknown about how greedy behavior will be represented in the visual depiction resulting from the reverse correlation task and because positivity and greedy behavior are both used as wealth cues, we assume that Hypothesis 1c is also a likely outcome:

Hypothesis 1c: Participants will attribute positive traits more likely to the visualized mental representation of the positive condition than to that of the greedy behavior condition. Furthermore, the images of both conditions will be seen as similarly rich and in fact richer than the visual representation of the neutral condition. (See Figure 4.2 for a graphical summary of the hypotheses).
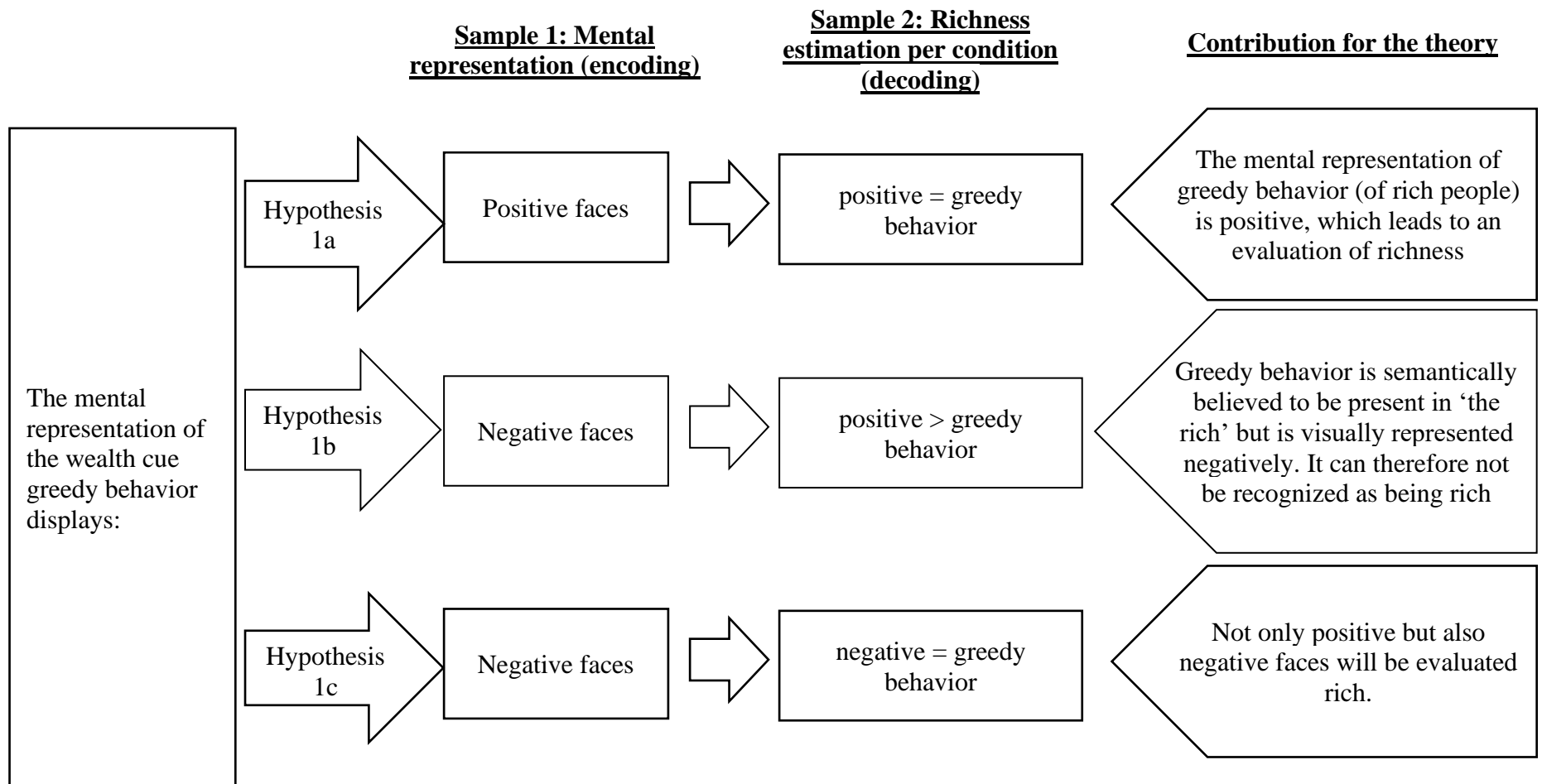
Figure 4.2.

Comparative hypotheses from Study 1 and their respective theoretical contribution in case of acceptance.

Method

Participants and Procedure

In total, $N = 201$ participants took part in Study 1. Data was collected from German native speakers on Prolific.co[7]. Eight participants were excluded in line with the pre-registration criteria so that the resulting sample consisted of $N = 193$ ($n = 48\%$ female, $M_{age =} 31.31$, $SD = 10.42$).

After answering questions about demographics, participants were presented with all three CIs (and afterwards also the anti-CIs) and were then asked to rate each picture individually in a randomized order. Participants were given the three CIs generated in the preparatory study and were asked to rate the applicability of positive and negative traits to the respective images. In addition, the participants judged how rich each of the depicted persons presumably was. Afterwards, participants were asked to also rate the base image. Lastly, participants were asked to rate the semantic cues of wealth to check whether individuals indeed use positive and greedy behavior cues to identify rich people (Rinn et al., 2022).

Measurements

Face ratings: Participants rated each facial image based on 17 positive and negative traits; indicating the degree to which a trait was observed in the picture presented. Seven positive adjectives were taken from Bjornsdottir and Rule (2017) (empathic, warm, hard-working, dominant, attractive, intelligent, healthy), plus ten additional adjectives that were randomly chosen from an adjective list. Five of these adjectives were negative traits (narcissistic, selfish, cold, submissive, arrogant) and the five were positive (educated, positive, charismatic,

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[7] All participants were paid according to the German minimum wage proportional for the estimated completion time per hour.

competent, likeable) in valence. The items' applicability of these descriptions was supposed to be rated on a likert-scale from 1 (not at all) to 7 (very).

Richness: Next, and in line with Bjornsdottir and Rule (2017), participants were asked 'What do you think, how rich is that person?' (answers ranging on a scale from 1 – 'not at all' to 7 – 'very'). For exploratory purposes we added 'what do you think is the net income per month of this person (in Euro)?'; 'What do you think is the socioeconomic status of this person?' (on an answering scale from 1 'very low status' to 7 'very high status'). Furthermore, participants were asked, in two separate questions, whether the depicted person would be a good leader or kindergarten teacher on a scale from 1 (do not agree at all) to 7 (fully agree) (the data are not reported here).

The Semantic Representation of the Rich: Afterwards, as in the preparatory study, the semantic representation of the rich was evaluated. That is, participants rated subjective theories about cues based on which it is possible to infer someone else's wealth. Specifically, participants rated agreement to 29 statements (taken from Rinn et al., 2022) such as: 'If a person has very expensive hobbies such as golf, it is a sign s/he is rich'. Importantly however, these subjective wealth cues pertained to the same features that had also been mentioned in the instruction of the preparatory study. To give an example item of the greed behavior dimension: 'If a person is miserly, it is a sign s/he is rich.' Additionally, participants were asked to evaluate whether it is possible to recognize rich people based on the positive characteristics that had been used as instruction in the positive condition of the preparatory study. One example item is 'A rich person has a high level of well-being'. These questions could also be answered on a scale from 1 (do not agree at all) to 7 (fully agree).

Analyses Preparation

To test the hypotheses that wealth and (positive and negative) traits would be differentially attributed the three CIs (positivity, neutrality, or greedy behavior), we first carried out an exploratory factor analysis to cluster the 17 positive and negative adjectives (for the results see Table 4.1). A maximum likelihood method with varimax rotation was used. We found two distinct factors, which we refer to as 'positive characteristics' (which contains items like: warm, likeable, attractive) and 'negative characteristics' (which contains items like: arrogant, narcissistic). One item (submissive) was not considered in the following reported analyses because it did not load on either of the two factors.

Table 4.1
Results of the EFA in Study 1.

	Factor	
	1	**2**
Likeable	**.82**	
Warm	**.80**	
Positive	**.79**	
Educated	**.79**	.31
Competent	**.76**	.37
Physical attractive	**.75**	
Charismatic	**.75**	.30
Intelligent	**.75**	
Empathic	**.69**	
Healthy	**.51**	
Hard-working	**.47**	
Arrogant		**.80**
Narcissistic		**.77**
Selfish		**.76**
Dominant		**.71**
Cold		**.54**

Note. Factor loadings lower than .30 were suppressed. One item (submissive) was removed due to bad factor loading

Results

Testing the Hypotheses: The Visual Representation

We first calculated a mean score for the attribution of positive characteristics and a mean score for attribution of the negative characteristics to each of the three CIs (and for descriptive purposes the Anti-CIs; see Figure 4.3B). These scores were then submitted to a 3 (condition: $CI_{positive}$, $CI_{neutral}$, CI_{greedy}) X 2 (valence score: positive / negative) repeated measurement ANOVA (results see Figure 4.3A). Results showed a main effect of valence, $F(1,192) = 23.61$, $p < .001$, $\eta^2 = .01$, a main effect of condition, $F(2,192) = 12.16$, $p < .001$, $\eta^2 = .01$, and – theoretically most important the expected interaction of valence and condition $F(2, 384) = 390.63$, $p < .001$, $\eta^2 = .51$.
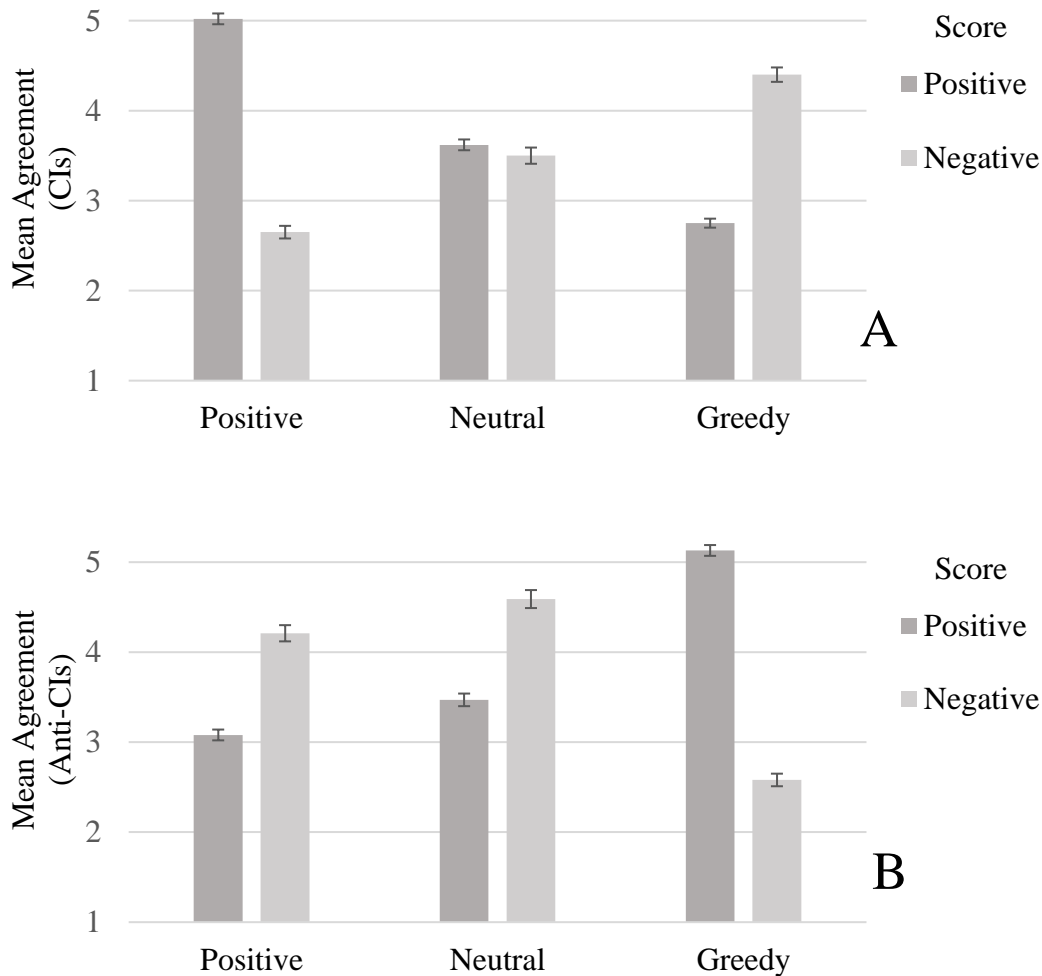
Figure 4.3.

Shows Study 1 results.

Note. The average ratings of the positive and negative scores over the positive, neutral, and greedy condition. Figure 4A shows results from the ratings of the CIs and Figure 4B shows the descriptive results from the ratings of the Anit-CIs. Error bars represent the standard errors of the group mean. Error bars represent the standard errors of the group mean.

As expected, simple contrast analyses via paired *t*-tests showed that the positive

characteristics ($M = 5.02$, $SD = 0.90$) were indeed more strongly attributed to the $CI_{positive}$ than the

negative items ($M = 2.65$, $SD = 0.99$, $t[192] = 22.42$, $p < .001$, $d = -1.70$). There was no such

difference regarding $CI_{neutral}$ ($M_{positive} = 3.62$, $SD_{positive} = 0.86$; $M_{negative} = 3.50$, $SD_{negative} = 1.26$;

$t[192] = 1.19$, $p = .24$, $d = -0.10$). Furthermore, positive characteristics were more strongly

attributed to the $CI_{positive}$ ($M = 5.02$, $SD = 0.90$) than to the $CI_{neutral.}$ ($M = 3.62$, $SD = 0.87$; $t[192] = 17.97$, $p < .001$, $d = -1.27$). Thus, the difference in the valence ratings of the three CIs in this study aligned with the conditions of the preparatory study where participants had been asked to always choose either a positive, neutral, or a face of a person who behaves greedy. The CI_{greedy} turned out to create a more negative ($M = 4.40$; $SD = 1.19$) than positive ($M = 2.75$, $SD = 0.71$) impression in our participants ($t[192] = 17.34$, $p < .001$, $d = -1.04$). In fact, $CI_{positive}$ was rated to have more positive characteristics than CI_{greedy} ($t[192] = 26.74$, $p < .001$, $d = -2.30$) and $CI_{positive}$ was rated to have fewer negative characteristics than CI_{greedy} ($t[192] = -15.69$, $p < .001$, $d = 3.95$). Together, these findings do not support Hypothesis 1a but are compatible with both Hypothesis 1b and 1c.

Attribution of Wealth

Lastly, the main and comparative hypotheses regarding the attribution of wealth to all three images were tested. To do so, a one-way repeated measures ANOVA was carried out to compare wealth ratings between the three CI images. The results revealed a significant main effect, $F(2,384) = 32.55$, $p < .001$, $\eta^2 = .08$.

Post hoc analyses via paired t-tests showed that, as expected, the $CI_{positive}$ was rated as wealthier ($M = 3.95$; $SD = 1.06$) relative to $CI_{neutral}$ ($M = 3.48$; $SD = 1.14$; $t[192] = 4.64$, $p = .009$, $d = -0.35$). Furthermore, both $CI_{positive}$ and $CI_{neutral}$ were rated as wealthier than CI_{greedy} ($M = 3.06$; $SD = 1.30$; $t[192] = 7.69$, $p < .001$, $d = -0.61$; and $t[192] = 3.71$, $p < .001$, $d = -0.28$, respectively). This result speaks in favor of Hypothesis 1b that the visual mental representation of face that displays greedy behavior is negative in valence, which in turn leads to a lower degree of attributed wealth. Figure 4.4 shows the average richness ratings of all CIs and Anti-CIs.
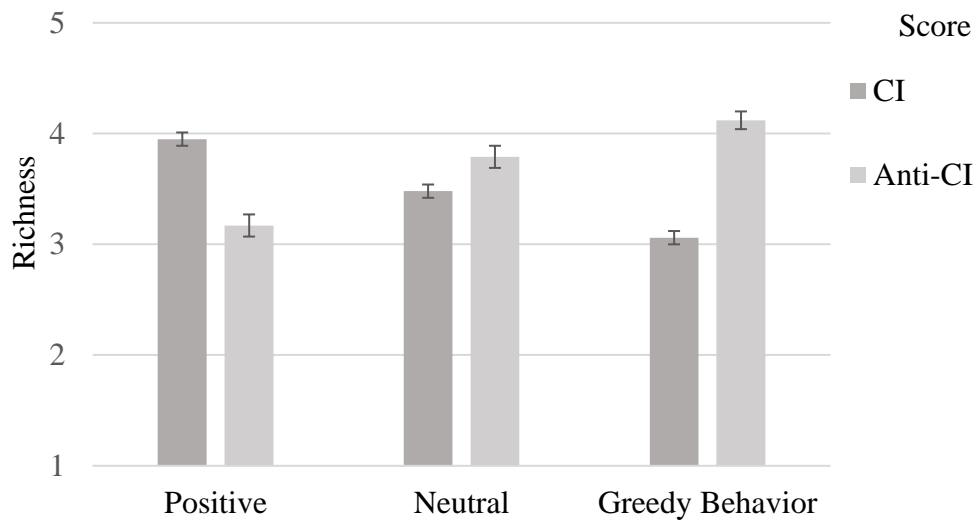
Figure 4.4
Shows Study 1 results of the richness estimation of the CIs and Anti-CIs.
Note. Error bars represent the standard errors of the group mean.

Testing the Subjective Validity of the Semantic Representation

Finally, we checked whether participants recognized rich people based on positive and greedy behavior characteristics. That is, it was tested whether participants indicated if positivity and greedy behaviors could be used as cues for wealth. Participants indeed indicated that one can identify rich people better by their positive characteristics ($M = 3.14$, $SD = 1.24$, $min = 1.00$, $max = 7,00$) than based on greedy behavior features ($M = 2.93$, $SD = 1.11$, $min = 1,00$, $max = 5.60$; $t[192] = 2.36$, $p = .019$, $d = -0.17$), though the difference was relatively small.

Discussion

In sum, the results of the first study are mainly in line with Hypothesis 1b. As expected, participants attributed positive traits more strongly to the $CI_{positive}$ than to the $CI_{neutral}$. Correspondingly, participants also presumed the person shown in $CI_{positive}$ to be richer than the one shown in $CI_{neutral}$. These findings are in line with previous investigations (Bjornsdottir & Rule, 2017, 2020). However, going beyond previous findings, it was observed that a CI that was

supposed to reflect greedy behaviors – which, as we showed, seems to be an important, though non-positive component of the representation about the rich – raised a clearly negative impression in others. In addition, participants attributed a lower degree of wealth to the face that displays greedy behaviors than to the positive or neutral looking face.

It seems that there is a dissociation between different formats of the mental representation of the rich. Recall that in previous studies individuals used positivity as a cue to identify rich people, when individuals were asked to infer wealth from faces (Bjornsdottir & Rule, 2017), and greedy behaviors when individuals were asked with an open answer format (Rinn et al., 2022). Thus, the data suggest a certain degree of ambivalence in the modality of the use of these cues. More specifically, data collected in the present study demonstrates that when individuals were asked to semantically indicate the degree to which greedy behaviors and positive characteristics were cues of wealth, that there was only a very small difference between positive characteristics and greedy behaviors. On the other hand, when individuals were asked to visually indicate their agreement that greedy behaviors and positive characteristics were cues to identify rich people that there is a medium to huge effect size in differences between positive characteristics and greedy behaviors. Thus, the partial ambivalence of the representation about rich that is found regarding its semantic components (including mainly positive features, but also greed) may not be reflected accordingly when it comes to its visual components.

The following findings further support our conclusions: Positive faces were judged to be richer than the faces that display greedy behaviors. Going beyond that, the comparison with the neutral condition suggests that positive faces' richness was augmented whereas richness in faces that display greedy behaviors was discounted. The latter result is also in line with Bjornsdottir and Rule (2020) who assumed that negative characteristics in faces more likely lead to the

attribution of lower social class. A possible explanation for this could be that people from different social classes experience different environments (for lower compared to higher class individuals more threatening, Kraus et al., 2012) that might be visible in the face after some time (Bjornsdottir & Rule, 2017; Oosterhof & Todorov, 2008). Social perceivers have acquired some intuitive connection between social class and the frequency of experiencing positive emotion and rely on this connection when judging others' richness. Wealth was inferred from positivity of the target person's facial features.

However, some aspects of Study 1 limit the interpretation of the findings. First, note that the dimensions on which participants rated the CIs were not phrased in the same way as the instructions given to the participants in the preparatory study. For example, in the preparatory study participants were asked to decide between pictures that expressed greedy behaviors (i.e., selfish, ruthless etc.), but greedy behavior was not used as a rating dimension for the CIs in Study 1. Furthermore, it is important to note that the participants in Study 1 rated the CIs on *generally* positive and negative dimensions – not on dimensions that assessed the degree to which positive or negative aspects specifically of being rich or behaving greedy apply to the depicted images. It may well be, for instance, that CI_{greedy} would have raised a generally negative and not specifically negative impression. So far, we do not know what characteristics participants would attribute to the CIs and especially to CI_{greedy}. To address these shortcomings and to replicate the previous results, we conducted Study 2.

Study 2

Study 2 aimed at replicating the findings from Study 1 with several extensions. First, we have no evidence yet that CI_{greedy} was indeed perceived as greedy. While there is evidence that some basic social traits such as dominance or trustworthiness go along with specific facial cues

(Oosterhof & Todorov, 2008), it might well be that participants are unable to decode greedy behavior from faces and thus might just have perceived *general negativity*. We call this alternative account a negative halo effect. However, one of the crucial points we wanted to test was whether people attribute richness to a negative looking face. So, does the impression that people form from greedy behaviors indeed include greedy behaviors or is this not the case? Answering this question was the first goal of the second study which we tried to reach by including specific ratings of greedy behaviors.

Furthermore, we included a hypothesis driven replication of the results of Bjornsdottir and Rule (2020) that negative faces would be associated with a lower social class and that the more positive cues a face contains the richer the respective person will be rated. As Study 1 provided evidence that faces that display greedy behaviors are evaluated as negative, faces that display greedy behaviors should thus be evaluated less rich than the neutral face. Finally, the dependent variable (positive and negative trait ratings) was adjusted, such that the provided trait dimensions corresponded more closely with the trait dimensions that had been used in the instructions of the preparatory study in which the CIs had been created. To give an example, for the positive trait ratings we now used the dimensions 'diligence', 'physical attractiveness', 'being in a positive emotional mood' and 'having a high level of well-being' (see above). We expected the following:

Hypothesis 2a: Compared to CI_{greedy}, $CI_{positive}$ will be rated as being more positive (in terms of diligence, physical attractiveness, being in a positive emotional mood and having a high level of well-being).

Hypothesis 2b: Compared to $CI_{positive,}$ CI_{greedy} will be more likely rated to behave greedy.

The second aim was to rule out the possibility that the ratings in the greedy behavior condition are subject to a negative halo effect, in the sense that participants had not inferred greedy behaviors from CI_{greedy}, but non-specifically negative characteristics in general. To do so, we asked participants quantitatively and qualitatively how they would describe the CIs. A negative halo-effect could be ruled out if we were able to find evidence for the following hypothesis:

Hypothesis 3a: Features of greed (e.g., greedy, selfish etc.) are more likely attributed to the CI_{greedy} than other generally negative features that are not associated with greedy behaviors (e.g., aggressive, sad).

However, if there is a negative halo effect, we should find evidence for the following hypothesis:

Hypothesis 3b: The supposedly greedy looking face simply evokes a generally negative impression in others, that is, specifically greedy behavior characteristics are as likely attributed to the CI_{greedy} than other generally negative features that are not associated with greedy behaviors (e.g., aggressive, sad).

Lastly, we aimed at replicating our previous findings that the negative facial cues of CI_{greedy} have a discounting effect when people estimate a person's wealth and that positive characteristics in contrast have an augmenting effect on these estimates.

Hypothesis 4a: $CI_{positive}$ is estimated as being richer than both $CI_{neutral}$ and CI_{greedy}.

Hypothesis 4b: CI_{greedy} is estimated as being less rich than both $CI_{positive}$ and $CI_{neutral}$.

Participants and Procedure

For Study 2, the sample size was reduced to $N = 130$ based on effect sizes observed in Study 1. The actual sample size in the present online study (Prolific.co), was $N = 136$ ($N = 129$ after exclusion due to violations of the pre-registered criteria from whom were $n = 45$ of female sex) and on average, participants were $M = 29.98$ years old ($SD = 10.03$).

After having read the instructions, participants viewed the three CIs from the preparatory study at the same time for at least 12 seconds. Afterwards, participants were asked to evaluate each CI separately in randomized order, first regarding perceived wealth and social class (as in Study 1). Next participants were asked to write down three characteristics of the face. Then, participants rated whether the faces of the CIs contained the features of greedy behavior and positivity characteristics that we asked the participants in the preparatory study (see above) to select during the reverse correlation procedure (we named the average score of the items of the greedy behavior condition 'greedy score'; and the average score of the positivity condition 'positivity score'). Furthermore, we collected eight negative characteristics (i.e., aggressive, sad, narcissistic, malicious, bragging, scrupulousness, complacency and desperateness) that were chosen randomly from an adjective list. There were no assumptions about which negative features were present in the CIs; and second, because we wanted to have a diverse spectrum of negative features to study in the exploratory factor analysis. These items were answered on both, a dichotomous scale (yes/no) and on a Likert scale 1 (not at all strong) to 7 (very strong). The items were chosen from an adjective list because they describe negative and distinguishable facial features and should therefore be appropriate to test Hypotheses 3a and 3b. Since the main goal of

this study was to examine the how individuals would rate the CIs, we did not collect data of the semantic representation of the rich.

Results

To test Hypotheses 2a and 2b, we calculated mean scores for the positive and greedy behavior items and submitted them to a 2 (characteristics: positive score / greedy score) x 2 (condition: CI$_{positive}$ / CI$_{greedy}$) repeated measurement ANOVA. The analyses revealed a main effect of condition, $F(1,128) = 175.24$, $p < .001$, $\eta^2 = .12$ and no main effect of the characteristics, $F(1,128) < 0.01$, $p = .98$, $\eta^2 = .00$. Most importantly however, we found the expected interaction of characteristics and condition to be significant, $F(1,128) = 545.11$, $p < .001$, $\eta^2 = .55$. Contrast analyses via paired t-tests revealed that, as expected, CI$_{positive}$ was rated as being more positive ($M = 5.03$, $SD = 1.07$) than CI$_{greedy}$ ($M = 2.02$, $SD = 0.91$), $t(128) = 26.40$, $p < .001$, $d = -2.16$. Furthermore, CI$_{positive}$ was rated less to behave greedy ($M = 2.99$, $SD = 0.95$) than CI$_{greedy}$ ($M = 4.04$, $SD = 1.25$), $t(128) = -9.37$, $p < .001$, $d = 0.96$. Thus, it seems that our manipulation in the preparatory study worked in the sense that the created image of the greedy behavior (positive) condition of the preparatory study does indeed evoke the impression to behave greedy (positive) in an unrelated sample of participants.

To check whether a negative halo-effect occurred, an EFA was carried out (ML with a promax rotation) with eight additional items that were collected additionally to the questions that refer to the instructions from the preparatory study. A two-factor solution was found. The first factor included seven characteristics with 'scrupulousness' 'malicious' having the highest loadings. Accordingly, we named this factor 'destructivity' and collapsed the seven items into one single score. The second factor consisted of the two items 'sad' and 'desperate' which we averaged into one score that we called 'depression' (see Table 4.2). Next, we compared the

greedy score with these newly and ex-post created scores using a repeated measurement ANOVA

where the three scores served as within subject factor. However, there was no significant main

effect ($F[2,256] = 1.16$, $p = .316$, $\eta^2 = .00$), indicating that there was no difference between the

greedy score and the destructivity and depression factors. This finding may be interpreted as

evidence for the presumed negative halo-effect: Participants attributed negative traits to the

depicted faces, irrespective of whether these traits are associated with greedy behavior or not.

Table 4.2
Results of the first EFA in Study 2

	Factor	
	1	**2**
Scrupulousness	.83	
Malicious	.77	
Aggressive	.68	
Bragging	.61	
Complacency	.59	
Narcissism	.57	
Sad		.74
Desperate		.97

Note. Factor loadings lower than .30 were suppressed.

To check whether this assumption is correct, we repeated the EFA by additionally

including the items that were framed in the same way as the instructions given to the participants

in the preparatory study. That is, another EFA was conducted where all 13 items (including the

greedy score items) were included. Note that this procedure was not pre-registered. Results (see

Table 4.3) revealed four dimensions, which we called (1) self-regarded, (2) destructive, (3)

miserly, (4) depressive and a single item ('ruthless lifestyle') that can only be considered

separately, which is why we neglected it for the following analyses. A repeated measurement

ANOVA with these dimensions as within subject factor showed a significant main effect with a

large effect size, $F(3, 384) = 52.47$, $p < .001$, $\eta^2 = .20$ (see Figure 4.5). Post hoc tests revealed

that CI$_{greedy}$ was rated as being more destructive ($M = 5.21$, $SD = 1.44$) than miserly ($M = 4.33$,

$SD = 1.48$, $t[128] = 6.61$, $p < .001$, $d = -0.58$) or depressive ($M = 4.06$, $SD = 1.67$, $t[128] = 5.90$, p

$< .001$, $d = -0.74$). Moreover, CI$_{greedy}$ was evaluated as less self-regarded ($M = 3.19$, $SD = 1.34$)

than destructive ($t[128] = 15.65$, $p < .001$, $d = -1.35$). Contrary to the previous analyses, this

result speaks against a negative halo-effect because it shows that CI$_{greedy}$ was rated rather

specifically destructive than generally negative. However, the observation also provides evidence

against the hypothesis that CI$_{greedy}$ was perceived to behave greedy.

Table 4.3
Results of the second EFA in Study 2

|	Factor				
	1	**2**	**3**	**4**	**5**
Narcissistic	**.89**				
Complacency	**.71**				
Bragging	**.61**				
Has a lot of free time	**.57**				
Malicious		**.92**			
Aggressiveness		**.85**			
Scrupulousness		**.40**			.31
Does not like to treat other peoples' dinner			**.78**		
Likes it to make more money	.49		**.56**		
Miserly			**.49**		
Desperate				**1.00**	
Sad				**.74**	
Has a ruthless lifestyle					.79

Note. Factor loadings lower than .30 were suppressed.
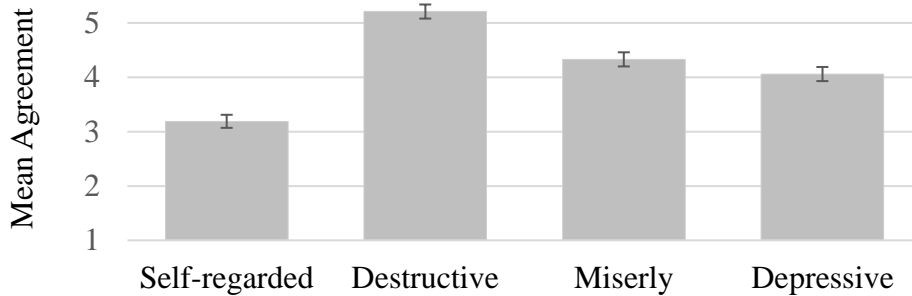
Figure 4.5.
Results of the alternative dimensions in Study 2.
Note. Evaluated facial feature dimension of CI$_{greedy}$. Error bars represent the standard errors of the group mean.

The qualitative analyses of the described emotions and personality traits of the CIs (that can be found for all three conditions in the Supplements S1-S2) show that most people described CI$_{greedy}$ to have emotions with a negative valence (e.g., annoyed) and with high or no activation (e.g., angry/unsatisfied) according to the framework of Remington et al. (2000). Furthermore, CI$_{greedy}$ was described to have personality traits with low extraversion (e.g., malicious, distant) and low conscientiousness (e.g., disorganized, impatient) according to the framework of Stemmler et al. (2016). These results match the quantitative data in so far as participants rated CI$_{greedy}$ to be 'destructive'.

Lastly, Hypotheses 4a and 4b were tested; that perceived wealth of CI$_{greedy}$ should be discounted and the perceived wealth of CI$_{positive}$ should be augmented compared to CI$_{neutral}$. Towards this end, a repeated measurement ANOVA was carried out, with the richness estimation per CI as within subject factor. As expected, a main effect was observed, $F(2, 256) = 94.52$, $p <$ .001, $\eta^2 = .03$. Post hoc tests revealed that indeed CI$_{positive}$ ($M = 4.43$, $SD = 0.98$) was rated being wealthier compared to CI$_{neutral}$ ($M = 3.60$, $SD = 1.17$; $t[128] = 6.17$, $p < .001$, $d = -0.60$). Furthermore, CI$_{neutral}$ and CI$_{positive}$ were rated wealthier relative to CI$_{greedy}$ ($M = 2.93$, $SD = 1.31$,

$t[128] = 5.37, p < .001, d = -0.50; t[128] = 10.67, p < .001, d = -1.53$, respectively; see Figure

4.6). The results thus confirm Hypothesis 4a and 4b.
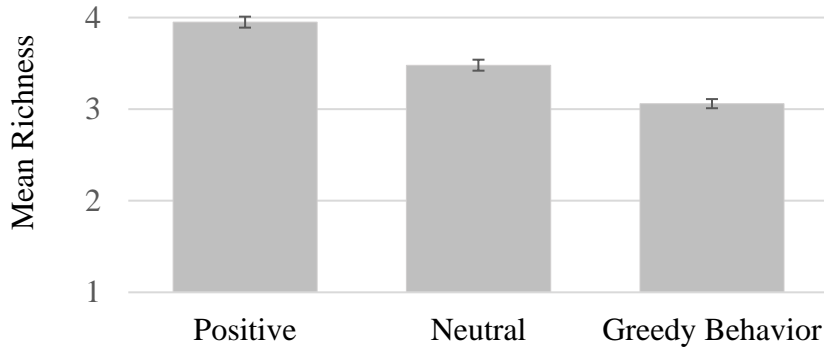
Figure 4.6.
Shows Study 2 results of the richness estimation of the CIs.
Note. Error bars represent the standard errors of the group mean.

Exploratory Analyses

To further examine which characteristics are used to infer wealth from the facial images

expressing the mental representation of greedy behaviors, an exploratory correlation analyses was

carried out between the wealth estimations and participant ratings of the face. As can be seen in

Table 4.4, there were negative correlations between the wealth ratings and perceived

destructiveness and depressiveness of the face in the CI_{greedy} condition ($r[129]= -.174, p < .01$ and

$r[129] = .-347, p < .01$ respectively). Furthermore, the perceived positivity was positively related

to the wealth estimates ($r[129] = .333, p < .01$). Notably, the ratings of greed and positivity were

also positively associated with each other ($r[129] = .211, p < .01$).

Table 4.4

Intercorrelations of wealth estimations and the rated characteristics of the face in the greedy behavior condition in Study 2

	1.	2.	3.	4.	5.	6.
1. Wealth estimation	-					
2. Greedy behavior	-.010	-				
3. Self-regarded	.087	.697**	-			
4. Destructive	-.174*	.547**	.449**	-		
5. Miserly	.035	.944**	.556**	.473**	-	
6. Depressive	-.347**	.045	.004	.008	.036	-
7. Positivity	.333**	.211**	.332**	-.220*	.170	-.037

Note. $N = 129$, *$p < .05$, **$p < .01$

Furthermore, to examine which characteristics are used to infer wealth from the face in the positivity condition, the correlation analyses was repeated using the data from the positivity condition ($CI_{positive}$). As can be seen in Table 4.5, only positivity and no other variable was related to the wealth rating ($r[129] = .230$, $p < .01$).

Table 4.5

Intercorrelations of wealth estimations and the rated characteristics of the face in the positivity condition in Study 2

	1.	2.	3.	4.	5.	6.
1. Wealth estimation	-					
2. Greedy behavior	.079	-				
3. Self-regarded	.087	.763**	-			
4. Destructive	-.070	.429**	.364**	-		
5. Miserly	.161	.916**	.666**	.433**	-	
6. Depressive	-.054	.147	.059	.637**	.171	-
7. Positivity	.230**	.209*	.134	-.344**	.122	-.314**

Note. $N = 129$, *$p < .05$, **$p < .01$

Discussion

The aim of this study was to examine which characteristics were attributed to the CIs. The mental representation of greedy behaviors, was, as predicted, ascribed more strongly to CI_{greedy} than to $CI_{positive}$ (and *vice versa* with positive characteristics in $CI_{positive}$). Considered in isolation

this result shows that the manipulation in the preparatory study worked and confirmed Hypotheses 2a and 2b.

However, it seems that other characteristics were rated to be more present in CI_{greedy} than those that we instructed participants to encode in the preparatory study, which provides evidence against Hypothesis 3a and 3b. Specifically, quantitative, and qualitative analyses revealed that the instruction of choosing faces that display greedy behaviors led participants to encode a specifically 'destructive' (dangerous) face rather than a face that would be decoded as just behaving 'greedy'. This observation provides evidence against a negative halo-effect, which was assumed to be observable in the sense that all negative traits are decoded at a similar likelihood.

Why did the instruction to encode greedy behavior result in an image that raised a destructive impression in other participants? One possibility is that participants in the preparatory study may not have been able to adequately select an image that reflects spefically greedy behaviors. That is, individuals may find it hard to recognize greedy behavior based on facial appearance. Alternatively, individuals who behave greedy might be perceived as being dangerous due to tendencies to behave in a ruthless or selfish manner (Lambie & Haugen, 2019; Wang & Murnighan, 2009). Thus, it may be that one component of the mental representation of rich people is destructiveness or dangereousness – a fact that to the best of our knowledge has not yet been examined before.

Notably, it seems that destructiveness results in attenuated perceptions of wealth while faces with positive characteristics result in augmented perceptions of richness. This finding speaks in favor of Hypotheses 4a and 4b and replicates previous findings (Bjornsdottir & Rule 2017; 2020) as well as the results of our Study 1. That is, we found that CI_{greedy} was rated less rich relative to $CI_{positive}$ and $CI_{neutral}$.

Again, there seems to be a dissociation regarding the components of the representation of rich people between the semantic and the visual representation format. Even though in this study the face that displays greedy behavior was seen as negative and less affluent, greedy behavior is still semantically related to wealth (Rinn et al., 2022). Thus, the question remains why this relationship was not reproduced in the facial expressions to the degree that it could be successfully decoded by other participants.

One explanation could be that faces that contain cues of destructiveness are less salient in the visual mental representation of rich people as compared to the sematic representation. This may be due to two reasons. First, individuals might think that faces of rich people only contain negative characteristics under certain circumstances, for example, in competition contexts or when the interests of rich people are threatened. This would imply that the negative facial appearance would be seen less often and thus be less represented (contextual explanation). Second, it might be that negative aspects of an individuals' representation of a rich person's face are compensated by positive facial characteristics given that rich people in general tend to look more positive (intensity explanation).

Notably, exploratory correlation analyses provided information on which cues are used for the wealth judgments. First, it was shown that in the CI$_{greedy}$ condition, destructiveness and depressiveness are negatively related to wealth judgement whereas positivity was positively related to wealth judgment. Second, there was a weak relationship between positivity and the wealth rating in the CI$_{positive}$ condition. Furthermore, in both conditions greedy behavior was not related to wealth judgments and there was a positive relationship in both conditions between positivity and greedy behavior. These results show on the one hand and in line with Bjornsdottir and Rule (2019) that there are "anti-cues" of wealth, that lead to an attenuated perception of

wealth (namely destructiveness and depressiveness) but only when the face is perceived negatively and not positively. On the other hand, the results provide evidence for our assumption that greedy behaviors and positivity are related to each other. As aforementioned, it was assumed that greedy behavior has positive facets as individuals might enjoy competitive advantages in their lives (Lambie & Haugen, 2019; Wang & Murnighan, 2009). This assumption seems to be in line with the correlative data that show that when individuals ascribed a high of level greedy behavior to the faces, a high level of positivity was also ascribed to the faces.

General Discussion

Taken together, the present research goes beyond the existing literature in several ways. Previous research found that wealth is strongly and primarily associated with positive descriptions and positive facial features (e.g., Bjornsdottir & Rule, 2017; 2020; Durante et al., 2017; Horwitz et al., 2014; Horwitz & Dovidio, 2017; Leckelt et al., 2019; Wu et al., 2018). At the same time, previous investigations have also revealed that wealth is semantically associated with greedy behavior (e.g., Parker, 2012; Ragusa, 2015; Rinn et al., 2022; Zitelmann, 2020). So far, however, little is known about how greedy behavior is visually mentally represented and whether and how people infer wealth based on greedy facial expressions. To address this research gap, we first created an image of a positive, a neutral face, and face that displays greedy behavior using the reverse correlation technique in the preparatory study. These faces were used as stimulus material in the following two experiments which were designed to test competing hypotheses against each other.

Because greedy behavior is a semantic component of the rich, one could assume that a face that displays greedy behavior leads to the attribution of richness. On the other hand, greed as such is at least an ambivalent, if not a clearly negative characteristic. Since previous research has

shown that there is a strong association between positive valence and richness (Bjornsdottir & Rule 2017, 2019), a face that displays greedy behavior may look rather negative, leading to lower attributed richness. Together our findings lend support for this second hypothesis. In other words, our findings show a differential pattern of associative links between richness and greedy behavior regarding the semantic versus visual representation. This dissociation shows that individuals use different attributes to encode cues that are used to identify rich people (as shown by Rinn et al., 2022) than when they are asked to decode rich individuals as rich.

Why might this be the case? One possible assumption is that by examining the cognitive processes involved in encoding characteristics as semantic attributes and decoding attributes from visual images separately, we can gain insights into the origin of this dissociation. Regarding the encoding: Individuals were forced to think about certain attributes of the rich and used information that they collected in the past to do so (e.g., by thinking about their personal experiences or conversations with their friends about the group of rich people, see Rateau et al., 2012). Thus, participants were likely to think about specific social situations and differentiated attributes to describe the appearance of the rich. By contrast, individuals might use different cognitive mechanisms to decode visual information. Here, individuals may rely on a simple halo effect since the faces with their attributes were the only source of information (e.g., being rich is positive, so positive faces must be rich). That is, participants were not forced to extensively think about attributes that are associated with wealthy people and could use simple (positivity) heuristics (Cheng & Tracy, 2013). One can therefore conclude that the en- and decoding tasks are likely to trigger two independent processes that lead to different results.

Lastly, contrary to the speculation that greedy behaviors have at least partly positive connotations (Lambie & Haugen, 2019; Wang & Murnighan, 2009), our findings show that cues

of greedy behaviors evoke a rather negative (destructive) impression in others. We had hypothesized that greedy behaviors might result in the encoding of positive facial characteristics because people who were assumed to be greedy, were in turn assumed to prioritize self-gratification and hence looking happier/ positive. However, our findings are only partly compatible with this notion as we have shown that positivity and greedy behavior are weakly related to each other. Instead, we observed that faces that expressed greed resulted in rather negative or dangerous impressions overall. Furthermore, it seems that this fact, in turn, led individuals to rate this representation of greedy behavior poor rather than rich (Bjornsdottir & Rule, 2020).

Our findings are indicative for current research and theory on face perception. According to the influential valence-dominance model of face processing (Oosterhof & Todorov, 2008), humans have a preparedness to quickly decode two basic features from faces: dominance and valence/trustworthiness. In other words, valence and dominance are orthogonal, basic dimensions on which faces vary and from which further inferences are generated. Applied to the present experiments, the valence-dominance model would imply that the instruction to encode greedy behavior would probably result in the generation of faces that fall in the negative-dominant region of the two basic dimensions. When these faces are decoded by observers, it might not be possible for them to infer greedy behaviors from the basic features negativity and dominance without more contextual information. This interpretation of our results would also broadly match recent observations pointing towards contextual variations in basic dimensions of face processing (Jones et al., 2021). Future research should clarify the role of contextual information for the de- and encoding of greedy behaviors.

Limitations

Our studies present novel pieces of evidence and need to be extended. One limiting factor is that participants were asked to rate only one CI per condition that was merged from all ratings in the preparatory study together. Such an image obviously contains only signals that are visible for all participants and neglects the variation between participants. However, the inter-rater reliability was between .86 and .91 which we consider as excellent, which means that participants generally agreed which face characteristics display positivity and greedy behaviors. Thus, we do not expect that the results would basically differ by considering the between-participants variation, however it might be that the effect sizes we observed with our method would be smaller.`

Furthermore, the current results and those reported by Bjornsdottir and Rule (2017, 2020) seem to be subject to a halo effect. That is, participants were asked to rate the richness or the status of faces. It might be that both words (richness/status) are perceived positively by individuals and that faces with positive valence match with these words, so that faces with a more positive valence are rated higher on these dimensions compared to faces with negative valence. Moreover, we only had two wealth conditions (positive vs. greedy behaviors). It might be that (the combination of) other cues are even more indicative for wealth than only unspecific positive features. Moreover, one might argue that using several cues to create the CIs might add unnecessary noise to the CIs. However, as argued above, the goal was to first create a representation of positivity, greedy behavior, and neutrality before having people select the faces. The goal was to depict the figurative core of social representations of positivity, greedy behavior, and neutrality (Rateau et al., 2012). Using more than just one item to depict a construct is a common approach in psychology to reduce measurement error (e.g., Krohne & Hock, 2007) and has also been shown to be a valid approach to create CIs in earlier research (Oliveira et al.,

2019a). Laslty, our research builds on the assumption that greedy behavior is a cue of wealth. However, it could be that there are other groups to which even more greedy behavior is attributed than to the rich. This is an alternative explanation why we did not find the link between CI_{greedy} and richness that cannot be ruled out although it was shown that the greedy behavior cues used in this study are specifically ascribed to rich people (see Rinn et al., 2022).

Future Directions

Our findings are novel because we are the first to use the reverse correlation paradigm to examine different modalities (i.e., semantic, visual modalities) of cues that are used to determine a certain group membership. In doing so, we found that when individuals were asked select faces that contained greedy behaviors, the merged face was then not recognized as such, nor were individuals able to recognize if the face contains cues of greedy behaviors. Instead, individuals assumed that the person in the picture was destructive. As suggested above, contextual or intensity considerations could play a role in why greedy behaviors are not recognized as greedy. However, it could also be that individual cues are not sufficient to be able to recognize wealth. Current research (Rinn et al., 2022) suggests that there are several wealth cue dimensions (e.g., greedy behavior, luxury consumption, self-presentation etc.) and it would thus be interesting to generate images from other 'wealth cues' with the use of a reverse correlation method. A merging procedure of pictures of different wealth characteristics to different degrees could then reveal the ratio of features that a person needs to have to be evaluated rich by most individuals.

Lastly, research has found that different subgroups of rich people exist (e.g., Black & Davidai, 2020; Christopher et al., 2005; Wu et al., 2018), and these subgroups are evaluated differently across cultures. It would be interesting to examine systematic differences in the mental representation of prototypical faces of these groups in different cultures. For instance, rich

people who acquired their wealth via external means (e.g., lottery winners) may be perceived significantly different (e.g., greedier) in some cultures than in others.

Summary and Conclusion

Our studies offer further evidence for the strong relationship between a positive appearance and wealth judgments. Furthermore, although negative stereotypes of rich people exist in the semantic representation in individuals, it seems that negative faces will not be rated rich. Overall, our findings suggest that positive stereotypes of wealth are so strong that they drive face-based ratings of richness to a much greater extent than do negative stereotypes. Additionally, and in line with previous research, our results suggest that negativity has a rather discounting effect when it comes to face-based ratings of richness such that negative faces look poor.

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General Discussion

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Background

  Since there are many definitions of wealth and because research has shown that specific stereotypes are ascribed to the rich, the current research aimed to a better understanding of the concept of richness and tried to understand how rich people are perceived. The studies in Chapters 1-3 were conducted to shed light on the perception of wealth and wealthy people. In the following section, I answer the research questions raised in the introduction and discuss them in the light of the empirical studies that were carried out in Chapters 1-3.

Answering Research Question #1

  Research Question #1 was to what extent individuals differ when they define wealth? To answer this question, Chapter 1 dealt with the question how individuals derive an income that is needed to be rich. In this chapter, observational and experimental methods were used in a series of four studies where a total of $N = 1038$ participants took part whose answers were analyzed. It was concluded that individuals use self-generated reference points or, put differently, anchors, as well as social comparisons to derive such estimates. In Chapter 2, a series of four studies was conducted in which observational and experimental methods where used. Altogether, the data of $N = 773$ participants were analyzed. One aim was to examine whether individuals from two Western countries that share a similar standard of living (Germany and USA) would perceive similar wealth cues as indicative for richness. Another aim of this study series was to examine whether individuals from Germany and the USA use the same set of cues to identify rich people and have a similar mental structure of these cues. In this study series, it was found that indeed individuals from both countries use similar cues and that individuals appear to mentally structure these cues similarly. However, it seems that individuals from both countries differ regarding the underlying wealth cue concept they have in mind.

Bringing the findings of Chapter 1 and 2 together and relating these to a broader literature to answer Research Question #1, one can conclude that individuals differ substantially when they want to define wealth, because the term "wealth" seems to be influenced by personal life circumstances of individuals. Evidence for this was reported in Chapter 1, which showed that individuals derive their wealth estimations from the use of strategies that people use when they are uncertain, such as social comparisons or anchoring heuristics (e.g., Epley & Gilovich, 2001; Epley & Gilovich, 2006; Festinger, 1954; Strack et al., 2016; Strack & Mussweiler, 1997; Tversky & Kahneman, 1974). If individuals would not differ based on inter-individual factors, the data pattern in Chapter 1 would have looked differently. For example, regarding an income that is needed to be rich, there would have been a greater agreement across individuals. This was not the case. Instead, several strategies were identified that individuals appear to use to estimate wealth. These included the rule: "rich means having more money than I have at the moment", the use of situational cues (such as one's personal income as an anchor for the estimation), and the use of social comparisons in comparatively higher income individuals. Notably, the mean value and the median of the estimations of what is needed to be rich varied substantially across the studies, which also suggests that people are not certain what it definitely means to be rich by income.

Similarly, we did find evidence that individuals differ when they want to define wealth in Chapter 2. In this chapter, we found that individuals utilize cues that might not be directly ecologically valid for recognizing rich people, such as spontaneous spending behavior (Kappes et al., 2021) or greedy behavior (Zitelmann, 2020). That is, these cues might be subjectively used by many people although they might not actually be valid. Furthermore, to some extent, it was a surprising result that although individuals from Germany and the USA use the same set of cues that are mentally structured similarly, individuals from both countries had a different wealth cue concept in mind. Again, if it would be the case that individuals from two different countries with a similar standard of living would not differ in criteria, they

use to define wealth, there would have been evidence for factorial invariance (i.e., a difference in the understanding of the wealth cue concept in Chapter 2). That is, there would have been evidence for a similar cognitive representation of the wealth cue concept. Instead, cultural influences seem to be a valid explanation for the finding that individuals from both countries had different wealth cue concepts in mind (see the discussion of Chapter 2).

Since there are great inter-individual differences in how to define wealth, it is no surprise that there are also several different definitions of wealth even in the scientific literature (see Concialdi, 2018; Grabka, 2014; Leckelt et al., 2019; Medeiros, 2006). It might be that these inter-individual differences come from several life-experiences of individuals or because of other considerations people can potentially make when they make judgments about wealth. For example, people can consider the subjective quality and quantity of certain objects. With subjectively I mean that goods have a (perceived or actual) value for people. For example, for some persons a cocktail at a festival might be a valued resource because it allows that person to have a good time whereas for others a can of expensive caviar might be a valued resource because these persons are real gourmets. With quantity I mean the frequency of the accessibility of certain objects. That is, the (perceived or actual) finite nature of objects might also explain inter-individual differences in the definition of wealth of individuals.

Answering Research Question #2

Notably, although from the current work it can be concluded that individuals differ in how they define wealth, individuals have attitudes regarding wealth and stereotypes about rich people that might or might not be valid (Leckelt et al., 2019; Zitelmann, 2020). Thus, to further understand what people mean when they talk about "the rich", Research Question #2 asked: Are there universal cues of wealth that individuals use to identify rich people? And if yes, in what sense do these cues depend on the situation or context?

To answer these questions, Chapter 1 examined the net income of a single person as a cue of wealth and found that German participants indicated that, depending on the study, a

median income of € 6000-8500 per month indicative for wealth. Considering these results at the time where the studies were conducted (2020-2022), this is approximately € 4000-6500 more than what the average employee in German earns (Statista, 2022) and it seems that a large proportion of participants attributed money (i.e., income) of one facet of the construct of wealth. This can be concluded since there were only few participants who indicated that € 0.00 is necessary to be rich. That money is an important aspect of the definition of wealth in individuals is in line with earlier research (Götte, 2015; Robeyns, 2019), and this finding validates the assumption described above, that wealth might be determined by the (actual or perceived) quality and subjective or objective quantity of an object, because for most people money is a finite good.

Although from this perspective, money can be seen as a valid indicator of wealth, the amount of how much money is needed to be rich depends on (the perception of) life circumstances of individuals. In Chapter 1, it was shown that individuals use their personal income, the income of the social circle and to some degree their own status within their social circles, to generate a number that is needed to be rich. Some of these ideas were also pronounced in recent research in which it was assumed that, to form an impression about subjective wealth (i.e., financial well-being, financial satisfaction, subjective socio-economic status etc.) individuals use reference points, comparison and (cognitive and affective) appraisal strategies (Tully & Sharma, 2022). However, over and above these considerations, Chapter 1 was the first study that systematically applied these theories to the context of wealth by income and the first study that found evidence for the use of such strategies within this context.

Beyond money, we found evidence for more wealth cues that are universally used by individuals to identify rich people. In Chapter 2, we showed that the following wealth cue dimensions are indicative for being rich: high spending willingness, luxury consumption, expensive hobbies, spontaneous spending, character, greedy behavior, charismatic behavior,

self-presentation, and possessions. Notably, this chapter has shown that these wealth cue dimensions indeed appear to be rather universal, as individuals from Germany and the USA agree that these cues can be used to identify rich people. Furthermore, as mentioned in Table 1.2 (in the introduction of the current work) and in Chapter 2, there is a broad body of research that used singe wealth cues that are similar to wealth cues that are clustered within the wealth cue dimensions for which we found evidence in Chapter 2. This implies that there are indeed cues of wealth that are relatively universally used by individuals (researchers/specialists and lay people) to identify rich people.

However, there are some contextual factors to consider, which show that these wealth cue dimensions cannot be generally considered as being indicative for wealth. First, as described in the introduction at the beginning of this work, one needs to consider cultural aspects when it comes to wealth. We found that there was no factorial invariance which showed that German participants and participants from the USA differed regarding their underlying wealth cue concept. Furthermore, in Appendix F and supplements of Study 2 in Chapter 2, it can be found that the subjective agreement that the wealth cue dimensions are indicative for rich people differs among individuals with a higher and lower income and also among individuals from Germany and the USA. To my knowledge, this has not been empirically shown before and provides again evidence for the context dependency of wealth cues. As aforementioned, it would not be surprising if hunter-gatherer people would have a completely different wealth cue concept in mind, than individuals from Germany or the USA (Cheng & Tracy, 2013; Lokuruka, 2006), because the perceived or actual quality and quantity of certain objects might differ between these individuals. Specifically, because of their different life-circumstances and differences in what the environment has to offer, individuals might perceive that the quality and quantity of certain objects is different which is likely to influence the wealth cue concept between these cultures.

Second, we found that cues that are used to identify rich people differ when it comes to rich subgroups which also shows that wealth cues are highly context dependent. Specifically, we found evidence for what we have called "wealth cue profiles". That is, individuals who earned their wealth via internal means are associated with different wealth cues compared to individuals who earned their wealth via external means (see Chapter 2). Thus, there is a lot of context dependency when it comes to wealth cues that are not only affected by the target (i.e., rich subgroups), but also affected on life circumstances and experiences of the individuals (e.g., whether one knows an objective rich person or not, see Zitelmann, 2020). Notably, literature suggests that the rich can also be distinguished based on other criteria, such as on what they spend their money for (e.g., charitable versus non-charitable or selfish purposes, Black & Davidai, 2020) and that wealth cues ascribed to the rich differ when individuals know someone who is objectively rich or not (Zitelmann, 2020). Thus, it can be hypothesized that other wealth cue profiles can be identified when one studies other wealthy subgroups.

In Chapter 3, a series of three experimental studies (where $N = 504$ data sets were analyzed) examined how the wealth cue dimension *greedy behavior* is mentally represented, and whether this mental representation would be considered as definitions of who or what is rich. To do so, the reverse correlation paradigm was used to create a visual image of a face that contains characteristics from the wealth cue dimension "greedy behavior". This visual image was then compared to a visual image of another wealth cue dimension, namely *positivity* (theoretically derived from earlier studies namely from Bjornsdottir & Rule, 2017, 2020) and against the visual image of a *neutral* condition. It was found that there are differences in faces regarding people's judgment of their estimated wealth. Specifically, the face from the positivity condition, that was perceived as having positive characteristics (likeability, warmth, positivity, etc.), was rated as richer than faces that were perceived as rather neutral and as richer than the face from the greedy behavior condition. Furthermore,

when asked on a scale from 1 (not at all) to 7 (very) how rich the person would probably be, the positive face was the only image that was rated such that its richness was above the mean of the scale (i.e., it had a mean above 3.5). In combination with earlier findings (Bjornsdottir & Rule, 2017, 2020), it can be concluded that positivity is a cue that people use to identify rich people.

Referring back to Research Question #2 (regarding the context dependency) in Chapter 3, we found that individuals use positivity as a visual wealth cue to identify rich people. This finding contrasts the results of the pilot study of Chapter 2, as these visual cues were not verbalized in Study 2. Accordingly, positivity was not part of the wealth cue model. Participants who took part in the Pilot Study of Chapter 2 rarely mentioned cues that are related to facial appearance (such as positivity), but focused on other (largely material) cues, such as spontaneous spending behavior, expensive hobbies and so forth. One reason for this might be that because appearance-related cues are less conscious than associations such as shopping behavior in connection with wealth, and when asked questions, one answers primarily with the associations that are not only "strongly anchored" in the mental representation of the rich, but that one is also conscious of. It thus seems that the modality, that is, providing visual information (versus asking verbally which cues people use) to identify the rich, plays a role in the richness judgments of individuals. The former result complements earlier research that found that richer individuals (i.e., individuals of higher social classes) can be (correctly) identified based on their dialect or non-verbal behavior (Ellis, 1967; Kraus & Keltner, 2009). These cues are also cues that did not show up in the Pilot Study of Chapter 2 either.

Answering Research Question #3

So far, we have learnt that there are inter-individual differences when people try to define wealth and that individuals have a somehow shared mental representation of rich people, although this representation depends on the context. Accordingly, the last research

question (Research Question #3) of the current work investigated whether there are situations under which those cues do not apply, that is, which circumstances make wealth cues invalid? This question is important to identify the situations under which a cue could potentially be considered a representation of wealth. To answer this question, one might first consider first the results of Chapter 1. Notably, although money seems to be of high importance when it comes to the definition of wealth, we found that some individuals indicated that € 0 of income is necessary to be rich. After consulting the literature (e.g., Götte, 2015), conducting several focus groups and having conducted a large series of studies that were not reported within the current work, I can conclude that people commonly think of additional factors that are related to wealth than only monetary factors. Specifically, in the subjective definition of people, the term "rich" sometimes means that a person has found inner peace, religious enlightenment, or people who are "rich in friends". Furthermore, as mentioned at the beginning, in the era when there was not such a thing like money and people relied more on other material goods (like food, a place to live, etc.). Thus, money might be related to wealth, but it seems that the wealth concept contains much more than financial or material goods, which would also explain why there was only a small amount of explained variance in the test of the assumed mechanisms in Chapter 1. Accordingly, there might be attitudes regarding wealth or concepts of wealth that might highly differ between individuals. One hypothesis one can derive from this consideration is that there might be differences in income wealth threshold estimations in the use of strategies between individuals who think that money is necessary to be rich compared to those people who do not consider money as a prerequisite to be considered as rich.

In Chapter 2, we have also seen some boundary conditions under which certain wealth cues appear to be invalid. On the one hand, for some subgroups, certain wealth cues were not perceived as indicative for their wealth (e.g., spontaneous spending was not indicative for those who earned their wealth via internal means [like hard work], but for those who got their

wealth via external means [e.g., by luck]). On the other hand, in Chapter 2 we discussed that students and two experts have generated these wealth cues. After I have talked to other subgroups of the society (e.g., non-academics) and after consulting the literature (Zitelmann, 2020), there might be other wealth cues when other subgroups of the society are asked what wealth cues they use to identify rich people. For example, Zitelmann (2020) found that individuals who personally know millionaires often indicate that rich people are intelligent, whereas most people who do not personally know a millionaire indicate that rich people can be regarded as self-centered.

Furthermore, in Chapter 2, we noted that there are differences regarding the answer formats which were used to ask people regarding their perception of wealth cues. Specifically, by asking participants *qualitatively* with an open answer format which cues they perceived as being indicative for wealth, some individuals responded that greedy- or charismatic behaviors are a sign that someone is probably rich. However, asking participants how much they would agree to this statement (i.e., that a rich person behaves greedy), it was found that the agreement with this statement was below the scale mean. This might be because greedy behavior is only a subset of the possible associations with wealth, but its association with wealth is context dependent. As we know with stereotype components, the positive and negative components are differentially activated depending on the context (e.g., priming). Thus, some wealth cues might only be present in the representation of the rich, but there might be specific contextual circumstances under which these cues cannot be accessed. This might be the case because individuals rarely think about these wealth cues in certain situations or because these wealth cues might only be implicitly represented. For example, it was found that positivity was not verbalized as a subjective wealth cue in Chapter 2, however, positive faces were rated as rich in Chapter 3. One might hypothesize that people do not spontaneously think of "positivity" when they are asked to freely associate characteristics with rich people or that the rich behave greedy in certain contexts (such as in business negotiation contexts or

when it comes to investment applications). Yet, in other circumstances they are not perceived as behaving greedy.

Lastly, in Chapter 3, we used the reverse correlation paradigm to visually depict the mental representation of the face of a person who either possesses characteristics of greedy behavior in Condition 1 or positivity in Condition 2 (both are characteristics or cues that have been shown to be valid wealth cues that individuals often use to identify rich people). Afterwards, participants were asked to indicate which characteristics they would ascribe to the resulting pictures. By using this method, we found that greedy behaviors of the rich were indeed not evaluated as such. Instead, they were rather evaluated as being destructive. This can be explained by the method of "back-and-forth translation" of semantic descriptions into a visual picture (the reverse correlation technique that we used in Chapter 3) and the rating of the characteristics in the visual picture with the use of semantic scales. That is, there might be some "fuzziness" in the translation processes, which means that there might not be a direct, completely accurate "translation" similar to non-verbal behavior, which can mean something different depending on the contexts. Specifically, regarding to an interpretation of greedy behaviors, participants might have tried to "compensate" for the lack of selectivity (i.e., discriminatory power) of the greedy behaviors by the corresponding context. Thus, the translation process from a verbal representation into a visual image revealed that some characteristics of rich people are represented in a very negative way. At the same time, these greedy behaviors were not evaluated as typical for being rich. This indicates that if one isolates individual wealth cue dimensions and looks at the core of the mental representation of individual wealth cue dimensions, they may not be perceived as rich anymore. A likely reason for this is that wealth cues are context dependent. Therefore, one might hypothesize that if the visual representation of the face from Condition 1 (greedy behavior) is presented in a certain context (e.g., in the context of other wealth cues), the face from Condition 1 should be more likely to be perceived as representing someone who is rich.

Further Considerations

Referring to social learning theories, it should be considered that people usually surround themselves with similar people (homophily; see Chapter 1). Information of others around a person are usually used when individuals are uncertain of what to answer (e.g., when they are asked to define wealth). Accordingly, in Chapter 1 and 2, it was shown that individuals predominantly use information from their own culture (for evidence, see the results on factorial invariance in Chapter 2) and information from their social circles to make wealth judgements. That means the total sum of the information that individuals use to build an impression of wealth can in some contexts be rather low, because of the many similarities that individuals may have with individuals of their own social circles and their own culture (e.g., shared experiences, beliefs, stereotypes). Accordingly, people who have a broader (compared to a narrower) and a more (compared to a less) heterogeneous social circle and people who live in a more (compared to a less) diverse society might be able to provide more accurate wealth judgements, because others provide information about wealth that can thus be taken into account to make judgements (Galesic et al., 2018). That is, overall, the presence of more information, could be a more solid basis for a more general, more balanced judgment.

One critical assumption of this work was that individuals use reference points to form an impression about wealth. Several authors mentioned that either situational accessible reference points can be used (Strack & Mussweiler, 1997; Tversky & Kahneman, 1974) or that personal life circumstances can be used to judge wealth (Brickman & Campbell, 1971). Furthermore, assimilation and contrast effects were mentioned as an explanation of how such reference points will be used to make judgments (Mussweiler & Strack, 2000; Strack & Mussweiler, 1997). One consequence of these considerations is, however, that it is not possible to exactly predict how individuals derive their judgment, for example, for an exact income (e.g., number of Euros) that is needed to be considered as rich. It might be that important psychological mechanisms are not yet identified that help to explain how

individuals derive their exact judgments, such as the use of certain cognitive strategies that are class dependent (Kraus et al., 2012).

One further consequence of reference point theories, such as the hedonic treadmill (Brickman & Campbell, 1971), is that people can never reach an 'end point' where they ultimately 'feel wealthy', because one prediction of the model is that if people reach a new set point, they get used to it and form another one. Put differently, it will never be possible to reach a clear end point where all people would perceive their money as being sufficient. This assumption is in line with our findings in Chapter 1 where we found that people add a certain amount of money on top of their income when they try to define wealth by income. Furthermore, in Chapter 2, we showed that individuals think that some wealth cues are indicative for wealth, and that the agreement that some cues are indicative for wealth is positively related to the income of a person (e.g., we found that individuals with a higher compared to a lower income agree that more spontaneous spending is indicative for wealth). Based on reference point theories that use arguments of habituation, it can be concluded that one would always find a positive relationship between the actual assets of individuals and the belief that more and more is needed to be rich. However, this seems rather unlikely, as there are individuals who consider themselves as being rich (such as some German politicians). From these observations, one might conclude that some psychological mechanisms that relate to the perception of wealth and wealthy people might only apply until a person is or feels rich.

Besides the reference point theories, I mentioned in the introduction of the current work age might be important to consider when examining wealth. Hansen et al. (2008) argued that compared to young people, older aged people are able to deploy different coping mechanisms, such as a downward adjustment of their personal needs or aspirations (like coping with poverty), which might be included as an additional source of information that might influence the estimation of wealth. Yet, in our studies, this was not the case. That is, we did not find evidence for a relationship between age and wealth estimations (see Chapter 1). It

might be that age is an important factor when using other questions or different methods when studying wealth. However, with regard to our current findings, it seems that age was not an important influential factor when it comes to estimate wealth by income.

Besides factors that we identified in Chapters 1-3 there might be other hypotheses that could be derived to define wealth. For example, justice attitudes might guide the definition and perception of wealth. That is, one might assume that whether one is currently focusing on performance justice, distributive justice or needs justice might influence the perception of wealth. If, for example, an individual's success is a product of hard work and effort (see Chapter 2), then one would possibly estimate a relatively high income threshold to classify someone as wealthy (and consider the current earnings as "normal" and justified) whilst someone who does not have many possessions and therefore hopes for needs justice would estimate people as rich who possess a lower sum (because they have significantly more than oneself and one has the feeling that they could give something to one). Indeed, there are recent findings that justice seems to impact the perception of wealth. Koo et al. (2022) have shown that people who became rich by their own work compared to those who were born rich find it less difficult to improve their socioeconomic conditions. Furthermore, the authors found that individuals who became rich indicate less support for redistribution and have less empathy for poorer individuals because they have more negative attitudes against the poor, presumably because they "became rich" and see their wealth as justly earned (performance justice) while the "born rich" have another understanding of justice.

Limitations

The main focus of the current work was to examine the subjective perception of material wealth. However, the literature suggest that the concept of wealth in people's subjective perceptions also includes intangibles (e.g., friends, family, religious enlightenment; Götte, 2015). That is, the present work has dealt with only one aspect of wealth, namely wealth in terms of financial aspects, and not with the whole range of what persons possibly

understand by the term wealth. Furthermore, there is a broad range of literature that examined the outcomes of financial wealth of individuals (e.g., whether wealth makes people happy; Boyce et al., 2010; Diener & Biswas-Diener, 2002; Killingsworth, 2021), work that deals with the perception of related concepts such as *status* (Anderson et al., 2015; Hill & Buss, 2006), and work that deals with the perception of poverty (Davidai, 2022). This research was only partially considered for the current work to differentiate the financial aspects of wealth from those other concepts accurately. A further limitation of this work is that it dealt exclusively with the subjective perception of wealth and wealthy people. That is, unlike other research (Bjornsdottir & Rule, 2017; Ellis, 1967; Gillath et al., 2012; Kraus & Keltner, 2009), it did not deal with the question of whether the wealth cues that were examined are indeed (ecological) valid indicators of wealth. This would however be interesting to further examine the cognitive mechanisms that might lead to the perception of wealth. For example, based on the lens model of Brunswik (Asendorpf, 2018; Brunswik, 1956), one can conclude that some cues are (socially) learnt to be indicative for wealth, although they are not valid. One question could be, why there are ecologically invalid cues and how they are learnt. To address this question, one might consider the wealth cue model that was developed in Chapter 2.

Future research

Although some proposals for future research were made within the single chapters, the broader literature review and the conclusions that were made within the introduction at the beginning and within the general discussion section at the end of the current work have shed light on some more ideas for future research. For example, in Chapter 1, it was shown that some individuals indicate that a higher value is necessary to be rich than other individuals do and it would be interesting to know at which point people stop looking for a plausible value. It would be valuable to find such "stopping rules", as this would be indicative for other research on numerical cognition, as well, although the mechanisms that people use to make wealth judgments might differ from other judgment processes, as the own status of individuals seems

to play a role in making such judgments (i.e., one's own status may function as a reference point for one's judgments).

In Chapter 2, a wealth cue model was identified. However, from a psychological point of view and to shed further light on the perception of wealth, it would be interesting to examine the psychological mechanisms that are used by individuals to judge (a) how high-qualitative wealth cues need to be and (b) how much (in terms of quantity) of the individuals' wealth cues must be present for assessing someone as rich. Examining this question could help us to better understand the subjective definition of wealth across different cultures and contexts. For example, one idea could be to ask whether it is possible to represent the subjective threshold at which the quality and quantity of different wealth cues is considered to be rich in a mathematical formula.

In Chapter 3, it was found that the visual depiction of the mental representation of the wealth cue "greedy behavior" was perceived as destructive rather than greedy. As aforementioned, it is likely that different context conditions lead to different mental representations of wealth cues. For example, the mental representation of greedy behavior was not perceived as rich, but it might possibly be perceived as rich in case of certain context information. Similarly, the mental representation of greedy behavior was represented as being destructive, and it might be that certain contextual information makes the wealth dimension "greedy behavior" look rich. Examining these questions could lead to a better understanding of the boundary conditions under which the wealth concept is formed.

Lastly, we have found that it depends on individual life circumstances how one defines wealth. One important life circumstance factor is the social class of a person, as it determines how much social power one has or how much money one can spend on different good. From this perspective, it would be interesting to examine social class differences based on theorizing of Kraus et al. (2012). The researchers suggest that individuals from higher

social classes (i.e., those with a higher education, a higher perceived social status, a higher income etc.) have different cognitive thinking styles in contrast to those who belong to a lower social class. Specifically, whereas individuals from higher social classes have a more solipsistic style of thinking (i.e., focusing more on individual goals), individuals from lower social classes generally have a more contextual style of thinking (i.e., an external orientation to the environment and a focus on managing external threats). It would be interesting to examine whether such thinking styles can provide information about the perception of wealth. For example, people from lower social classes could respond to criteria of wealth cues aiming at protecting from external threats, while people from higher social classes might respond to wealth cues that are particularly good at satisfying people's individual needs and personal fulfilment. Answering this question could provide evidence on the development of political attitudes toward rich people of individuals of different social classes, because it would help to explain why some people are perceived as being rich by some individuals and not by others.

Summary

In this work, empirical evidence was provided that the perception of wealth and wealthy people depends on: (1) the person (i.e., personal life circumstances), (2) the people with whom one is surrounded (social circle / culture), (3) situational cues that are available in certain contexts, (4) the sensory modalities that are addressed when one studies the perception of wealth (i.e., is the person asked to estimate something by herself / himself, or are individuals asked to say what they think themselves? Are they asked to judge pictures?), (5) the wealth cues that are available for selection or the subgroup of rich individuals one is interested in. Furthermore, it is likely that the perception of wealth depends on the objective and subjective quality and quantity of certain goods. Like for other works that dealt with the perception of wealth, for the current findings, it can be concluded that: "(…) observers face a complex attributional puzzle, inferring unobservable forces that determine wealth and poverty from observable behaviors and outcomes. In solving this puzzle, people try to determine

whether outcomes reflect internal forces (i.e., individual dispositions), external forces (i.e., societal and situational factors), or a mixture of both", (Davidai, 2022, p. 42). Thus, when making political decisions, decisions in court cases, or when it comes to police work, practitioners should keep in mind that wealth is a subjective concept, and also that rich individuals (like other groups of people) are likely to be stereotyped.

Conclusions

The present work is one of the first that have dealt intensively with the perception of wealth and rich people from a psychological point of view. It extends the current research in several ways, as it becomes particularly clear that people have a concept of wealth in mind which they often find difficult to define. Because there is no well-defined, objective, or subjective representation of what "being rich" truly means, people take reference points and situational cues from the (social) environment into account to define wealth. Furthermore, in compliance with earlier work, it has been shown that people do not perceive themselves as being rich and that for many people an income that is needed to be rich is way above what they currently earn. Notably however, for some people money is not indicative for being rich. Furthermore, individuals have a subjective representation of the rich in mind and develop a mental structure about such wealth cues that help them identify rich individuals. However, these cues are context-dependent, meaning that they vary by situation, culture, or even subgroups of the rich. Thus, these wealth cues are not always indicative for richness, but it needs some contextual information, so that some cues can be a subjectively valid indicator of wealth. The conclusions reported in this work form the basis for further research on the perception of wealth and wealthy people, as it advances our understanding of how wealth and wealthy people are perceived.

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