

When Envy Breeds Desire:  
Consequences of Uncontrolled Comparisons with Better-Off Others

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## Abstract

Envy is an unpleasant emotion that results from a negative social comparison, such as when people become aware of someone possessing a superior good. A central component of envy seems to be the desire for this superior fortune. Despite its important implications, empirical evidence on the psychological underpinnings of envious desire is lacking. Assuming that people are motivated to control their spontaneous envious reactions, I predict that envy and envious desire are strongest when resources to exert self-control are taxed. To evoke envy, participants were invited to a taste test. Some of them completed this taste test in the presence of other persons who were asked to taste a more attractive food. In Experiment 1, participants, who were in the presence of a more fortunate person assigned to taste chocolate, were more dissatisfied, angrier, and more envious the more intoxicated they were. This did not happen when they were asked to taste their less attractive chewy candy alone. In Experiment 2, participants envied their experimental partner, who was assigned to taste an attractive ice cream instead of the inferior biscuit assigned to them, most intensely under high cognitive load. Furthermore, they reported a higher willingness to pay for the ice cream than participants in any other condition. In Experiment 3, participants in an envy evoking experimental condition were most likely to spontaneously purchase the better product under high cognitive load. In Experiment 4, automatic approach behavior towards the more attractive food of the neighboring participant was increased under high cognitive load. The findings shed light on the determinants and the consequences of envy on economic judgments and decisions.

## Deutsche Kurzzusammenfassung

Neid ist eine unangenehme Emotion, die nach einem negativen sozialen Vergleich entstehen kann. Als wesentliche Komponente wird dabei häufig das Verlangen nach dem Objekt, um das man jemanden beneidet, betrachtet. Obwohl ihm weit reichende Folgen zugeschrieben werden, sind die psychologischen Grundlagen neidvollen Verlangens bisher kaum empirisch erforscht. Unter der Annahme, dass Menschen motiviert sind, ihre spontanen Neidreaktionen zu kontrollieren, sagte ich vorher, dass Neid und Verlangen dann am stärksten sind, wenn Selbstkontroll-Ressourcen beeinträchtigt sind. Um Neid auszulösen, wurden Versuchsteilnehmende gebeten, Geschmackstests durchzuführen. Manche befanden sich dabei in Gegenwart einer anderen Person, die ein attraktiveres Lebensmittel verkosten durfte. In Experiment 1 waren die Teilnehmenden in Anwesenheit einer mit Schokolade besser gestellten Person dann umso unzufriedener und neidischer, je mehr Alkohol sie getrunken hatten, nicht aber, wenn sie ihr weniger attraktives Kaubonbon allein probieren sollten. In Experiment 2 beneideten sie einen Versuchspartner, der ein attraktives Eis und nicht die ihnen zugeteilten Kekse probieren sollte, vor allem dann, wenn sie kognitiv beansprucht waren. Zudem gaben sie die größte Zahlungsbereitschaft für das bevorzugte Eis an. In Experiment 3 war es unter gleichen Umständen am wahrscheinlichsten, dass sie das bessere Produkt spontan kauften. Schließlich war in Experiment 4 automatisches Annäherungsverhalten in Bezug auf das attraktivere Lebensmittel bei kognitiver Beanspruchung am größten, ohne kognitive Beanspruchung aber eher verringert. Die Ergebnisse beleuchten die Entstehungsbedingungen und die Art der Folgen, die Neid für Urteile und Verhalten hat.





## Introduction and Theoretical Background

Becoming aware of someone who possesses something better and more desirable must be an experience that everyone knows. For example, I admit having suffered the following situation more than once: I am visiting a restaurant to have dinner with family or friends. After contemplating the interesting options of the menu for some time, I choose the one that seems best to me. However, once the dishes arrive, disappointment strikes. The food of my neighbor looks so much more delicious! I want it badly. If only I could change my decision!

The present thesis deals with envy-evoking situations like these and the envious desire that is instigated in them. Of course, even though it might be detrimental to dinner enjoyment, even the most serious case of “entrée envy” is unlikely to have grave consequences and may be easily coped with. However, in other situations, being aware of someone who is better off and the ensuing emotional reaction might change subsequent decisions and behavior drastically. What if people are about to decide which vacation to book, which apartment to rent, or which car to buy, and happen to be reminded that a colleague is better off than what they were aiming for? Will they choose a fancier hotel for their vacation, rent a more spacious apartment, or be willing to buy a more expensive car because of the envy they might experience?

Throughout history, numerous scholars have argued that being aware of someone with a superior good instills the desire to obtain this good, and that this is one of the reasons to believe that envy has vast interpersonal, societal, and economic

consequences (Aristotle, trans. 1929; Foster, 1972; Frank, 2000; Girard, 1979, 2001; Rawls, 1971/1999; Schoeck, 1971). The biblical tenth commandment “You shall not covet your neighbor’s house” warns about the negative impact of envy. On the other hand, being motivated by the awareness of others’ greater fortunes has also been assumed to cause socially beneficial striving to attain better outcomes (Barnett, 1953; Corneo & Jeanne, 2001; Rawls, 1971/1999). Despite its important implications, experimental evidence on the psychological underpinnings of envy and envious desire is lacking. This dissertation seeks to reduce this empirical gap by applying a social cognitive approach to the investigation of envious reactions.

The basic hypothesis underlying the present research is that becoming aware of a better-off other person evokes envy, entailing an impulsive striving for the superior good of the other. As people compare themselves spontaneously and without effort, envious desire should be an automatic reaction in response to superior others. Nonetheless, envy seems unlikely to be an inevitable outcome of such situations. Envy is a particularly negative emotion. It is painful, it threatens the positive self-views that people strive to maintain, and it is an emotion that others find very objectionable. That is why people should be motivated to control and alter their emotional reaction. In other words, being faced with a better-off other puts people in a situation in which they experience a conflict between their impulses and self-control. Thus, the emotional, judgmental, and behavioral consequences of a potentially envy-evoking situation should be determined by the outcome of this conflict. Therefore, envy and the envious urge to acquire the object that is causing it should prevail when people’s capacity to exert self-control is constrained.

## Envy and Desire

*It is because you focus on the prize  
of worldly goods, which every sharing lessens,  
that Envy pumps the bellows for your sighs.*

—Dante Alighieri, *The Divine Comedy* (1312/2003, p. 413)

### *Components of Envy*

The question “What is envy?” is not an easy one to answer, as is evidenced by the lengthy and controversial scholarly debates about its defining features (for reviews, see e.g., Leach, 2008; Miceli & Castelfranchi, 2007; R. H. Smith & Kim, 2007). Some initial clues may be provided by the relatively broad definition of the Merriam-Webster dictionary (2009), according to which envy is the “painful or resentful awareness of an advantage enjoyed by another joined with a desire to possess the same advantage.” This definition of envy is noteworthy in several regards. First of all, it emphasizes that envy is a negative emotional reaction. It feels bad to be envious. Furthermore, it implies that this reaction is the consequence of a social comparison with a superior comparison standard (i.e., we notice someone who possesses something desirable that we do not have). The definition also denotes that experiencing envy can entail very different negative feelings, such as pain or resentment. And finally, it highlights that part of envy is the desire for the superior fortune of another person that one has become aware of. Particularly the latter point is central to the present work.

Most scholarly analyses concur that envy is a multi-faceted emotion, a complex mixture of different experiences that may include feelings such as longing for the superior fortune, discontent, resentment, anger, and shame about one's own inferior status and ill will (Miceli & Castelfranchi, 2007; R. H. Smith & Kim, 2007). Envy has to be distinguished from related emotions that are sometimes confused with it. An example is jealousy: While envy involves wanting to possess something that one lacks but another person has, jealousy occurs when one fears to lose an important relationship to a rival (Parrott, 2001; Parrott & Smith, 1993; R. H. Smith, Kim, & Parrott, 1988). Envy is also different from "righteous" indignation about inequality (Rawls, 1971/1999). While being envious has been claimed to include a subjective feeling that one's inferiority is undeserved (Ben-Ze'ev, 2001), "resentment proper" arises when another person's advantage results from unfair treatment, especially when the unfairness can be determined by agreed on standards. In contrast, invidious resentment arises when a perceived advantage is painful but objectively fair (R. H. Smith & Kim, 2007; R. H. Smith, Parrott, Ozer, & Moniz, 1994). What complicates matters, however, is that an envious person might strategically seek evidence for injustice in order to rationalize and legitimize his or her emotional reaction and thus, envy might be transmuted into resentment (R. H. Smith & Kim, 2007). It is also important to distinguish envy from admiration. While envy shares some resemblance with admiration in that it is a reaction to perceiving someone with a superior fortune or accomplishment, admiration is a pleasant experience. In contrast, envy is frustrating (Van de Ven, Zeelenberg, & Pieters, 2009) and painful (Takahashi et al., 2009). Finally, it shall be noted that some theorists limit the term envy to emotional episodes that include the malicious ill will to destroy or

take away the advantage enjoyed by another person. As I will argue in more detail later (see Excursus: Malicious and Non-Malicious Envy, p. 9), I think that there is good reason to believe that it is warranted and more fruitful to define envy in a broader sense, such that emotional episodes in response to perceiving superior others are covered that may or may not lead to malicious thoughts and actions.

### *Envious Desire*

While the theoretical debate about what constitutes the necessary elements of envy and how envy differs from related psychological phenomena is controversial and partly inconclusive, it is generally agreed upon that the longing for the superior possessions or characteristics of other people is a central element of envy: “Envy usually includes an intense longing for what another has” (Parrott, 2001, p. 311; see also Leach, 2008; Miceli & Castelfranchi, 2007; R. H. Smith & Kim, 2007). Several empirical studies exploring the experiential components of envy support this assertion. For example, using a scenario approach, Bers and Rodin (1984) asked school children to imagine the emotional reaction of a child to another child which had superior abilities or superior possessions. The children saw the desire to have what the superior child had as most central to what the character of the story would feel. Similarly, when asked to distinguish a recalled episode of self-experienced strong envy from jealousy, participants of a study by R. H. Smith, Kim, and Parrot (1988) considered the motivation to improve, feeling wishful, and the longing for the superior fortune of the other as most characteristic of envy. They also associated feeling dissatisfied and inferior with envy. These results were replicated in another experience-sampling study

by Parrot and Smith (1993, Exp. 1) without pitting envy against jealousy. Participants vividly recalled and then described an episode in which they felt strong envy. Subsequently, they rated the extent to which the items of a lengthy list of feelings and emotional thoughts were descriptive of their experience. Participants reported the “longing for what another has” to be most characteristic of their experience. Also, feeling wishful towards the superior fortune of another person was seen as highly characteristic. As in R. H. Smith et al.’s (1988) study, another recurring theme among participants’ descriptiveness ratings was the disappointment and discontent about not having what the other has. For example, they reported frustration, unhappiness, and felt emotional pain. They also expressed having been upset, angry, and resentful. Thus, according to empirical investigations of how people experience envy, its most salient component seems to be the longing for what another person has, accompanied by feelings of discontent and anger. Based on these findings, for the present research, I pragmatically define envy as an unpleasant emotion following a social comparison to a better-off person that entails discontent and anger about lacking the person’s good fortune and desiring this fortune (for a similar conception, see Leach, 2008).

But what is the specific role that desire plays in envy? Parrot (2001) speculates:

[Envious] longing is brought on by focusing on the desired object or quality, by being aware of how much it is desired, and by being frustrated in this desire both by lacking it and by knowing that another person has been able to possess it. (p. 311)

Thus, according to Parrot (2001), the importance of desire in envy is twofold: On the one hand, desire is a precondition for experiencing envy: People feel envious because

they become aware of someone possessing something they want themselves. On the other hand, being envious itself may cause the desire for the object or quality they see possessed by others: People want something because someone else has it. Some theorists (e.g., Young, 1987) even consider this as a necessary definitional element. According to this view, envy occurs to the extent that someone wants something *just because* another person possesses it.<sup>1</sup>

The idea that the awareness of others superior fortune may instill the desire for these fortunes is an old one. In the *Rhetorics*, Aristotle (trans. 1929) argues that a form of envy – he called it “emulation” – spurs our motivation to gain what the other person has and to improve ourselves. This is one of the reasons why envy is often assumed to have vast interpersonal, economic, and societal consequences. Girard (1979, 2001) contends that people are fundamentally influenced by what he called “mimetic desire”: We want what belongs to our neighbor. To him, this is the very foundation of the human condition, the root of envy, rivalry, social conflict, and ultimately violence (Girard, 2001). Economic consequences of envy have been stressed in what Douglas and Isherwood (1979) call the “envy theory of needs”, according to which consumers’ preferences can often be explained by envy rather than the intrinsic value of goods. In line with this view, marketers often aim at capitalizing people’s emotional responses by trying to evoke envy in consumers (Belk, 2008). Optimistically, Rawls (1971/1999)

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<sup>1</sup> I agree to Miceli and Castelfranchi’s (2007) objection that it would be unwise to rule out cases in which one already desires and values the good regardless of a rival. However, a crucial feature of envy might be that becoming aware of someone else having what we want evokes and intensifies our desire for it.

believed that “emulative envy (...) leads us to achieve what others have” (p. 467) and “(...) moves us to strive in socially beneficial ways for similar things ourselves” (p. 467). Indeed, being motivated by other’s superior fortune has been speculated to spur innovation (Barnett, 1953) and has been related to economic growth (Corneo & Jeanne, 2001). On the other hand, excessive consumption and overspending caused by perceiving better-off others may also have severe detrimental effects on economies and the environment, such as rising consumer debts, the occurrence of bankruptcy, pollution, and the depletion of natural resources (Frank, 2000). A number of sociologists, anthropologists, and political scientists believe that envy has had and continues to have a significant impact on culture and societies. For example, Foster (1972; see also Douglas and Isherwood, 1979) argues that complex beliefs, social norms, and rites have evolved to control envy and deflect the negative consequences of envious desire. An example is the fear of the “evil eye”, a belief that according to Foster (1972) serves to keep people from inciting envy in others by motivating them to conceal their fortunes. Further examples involve customs of the distribution of wealth, (e.g., tipping) or symbolic sharing (e.g., consolation prizes). Other authors (e.g., De la Mora, 1987; Schoeck, 1971) even claim that egalitarianism and people’s striving for social equality is grounded in envious desire, causing profound effects on societies: According to Bertrand Russell’s (1930) famous dictum, “envy is the basis of democracy” (p. 83).

### ***An Evolutionary Account of Envy***

Even though some cultural differences in the expression of envy exist (Lindholm, 2008), it seems to be an almost universal human experience (Foster, 1972;



Schoeck, 1971). Why is this the case? And why is the desire to gain another person's qualities or possessions so central to envy? From an evolutionary perspective, it has been argued that envy is an adaptive emotion (Hill & Buss, 2006, 2008). Presumably, in human history, reproductive success was determined by the relative standing in comparison to rivals in the social context and not by absolute success in fitness-related domains. According to Hill and Buss (2006), that is why natural selection has favored the development of a positional bias in human thinking: Individuals should be motivated by the desire to offset the advantage enjoyed by superior others and not by absolute amounts of status and resources. Furthermore, the emotional nature of this positional bias can be explained by strategic interference theory (Buss, 1989), which posits that negative emotions have been evolved to signal that there is an interference with a behavioral strategy aimed at ensuring adaptive fitness. According to this perspective, subjectively negative and upsetting emotional reactions serve to focus attention to the adaptive problem and motivate to reduce the strategic interference. Hence, envy might be an "emotional adaptation that has been shaped by selection to signal strategic interference in the quest for resource acquisition" (Hill & Buss, 2008, p. 62). Thus, as other emotions, it might have evolved to prepare people to take urgent action in response to important situational needs (Frijda, 1986). I hypothesize that the default action tendency of envy is to try to attain the superior fortune as well.

### ***Excursus: Malicious and Non-Malicious Envy***

A distinction that is often discussed prominently in analyses of envy concerns the role of malicious ill will. Envy is often claimed to exist in two forms, one, which is

free of hostility and does not contain any motivation to harm the person who possesses an advantage, and another one, which is dominated by this desire (e.g., Neu, 1980; Rawls, 1971/1999; Taylor, 2006). Parrot (2001) traces this distinction back to Aristotle (trans. 1929), who wanted to point out the different consequences that perceiving the superior fortunes of others can have, by distinguishing (morally good) emulation from (morally bad) envy. Aristotle assumed that emulation motivates people to improve themselves, while what he called envy motivates people to take their superior fortune away. Later, envy theorists have followed this notion by distinguishing “admiring” (Neu, 1980), “benign” (Rawls, 1971/1999), or “emulative” (Rawls, 1971/1999; Taylor, 2006) envy from “malicious” (Neu, 1980), “destructive” (Taylor, 2006), or “proper” (Rawls, 1971/1999) envy. On the basis of this distinction, some authors limit their definition of envy to emotional experiences that contain malignant elements (e.g., Miceli & Castelfranchi, 2007; R. H. Smith & Kim, 2007; Rawls, 1971/1999).

However, as Parrot (2001) notes, these modern conceptualizations of envy depart from Aristotle’s original distinction to some extent and the change of meaning might sometimes confuse rather than enlighten the understanding of envy. For example, the term “admiring envy” could be misleading because even though it does not contain hostility, the focus of an envious reaction might be directed primarily at the envy-object and entail little admiration for its owner. That is why I follow Parrot’s (2001) preference for the terms non-malicious versus malicious envy. Another reason is that the words “admiring” and “benign” envy carry the connotation of a purely positive emotion. However, the emotion that Aristotle referred to by what he described with the word “emulation” was hedonically clearly negative, as he defined it as the pain caused by

seeing others possessing goods that people can in principle acquire themselves (Aristotle, trans. 1929). Thus, the original distinction is not primarily a psychological one, but rather one in moral terms. In other words, part of the confusion might stem from the level of analysis: Morally, malicious, and non-malicious envy are of course very different. However, this does not imply that they are not rooted in the same psychological phenomenon. Thus, to dismiss non-malicious envy episodes may obscure the psychological processes that govern the emergence of negative emotional reactions in response to upward comparisons.

Furthermore, the quantitative literature on how people experience envy does not warrant the inclusion of malicious ill will as a necessary definitional criterion. If people are asked to characterize envy experiences, usually, malicious ill will is only moderately associated with them (Bers & Rodin, 1984; Parrott & Smith, 1993; Salovey & Rodin, 1984, 1986; R. H. Smith et al., 1994). Reviewing this literature, Leach (2008) concludes that anger about a frustrated desire best characterizes envy. Furthermore, he argues:

The anger in envy is not necessarily associated with malicious ill will, or the desire to harm the fortunate party. However, because people reported that anger was central to their experience of envy, it is clear that the envy in these studies was not benign. (p. 99).

Recently, Van de Ven and colleagues (2009) directly assessed the differential characteristics of malicious and non-malicious envy, both by using latent class analysis of descriptions of envy experiences and by comparing emotional episodes of malicious and non-malicious envy, admiration, and resentment gathered by guided recall. When participants were asked to recall and characterize an envy episode, about half of them

described an experience that contained malicious ill will, while the other half described emotional episodes free of malicious elements. Non-malicious envy was associated with some admiration for the other person, but differed from pure admiration because – similar to malicious envy – it was highly related to frustration, inferiority, and felt unpleasant. Malicious envy had a somewhat higher resemblance with resentment by being associated with thoughts of injustice. However, resentment differed from malicious envy by containing less admiring feelings and even more intense negative affect toward the other person, presumably because the other person was willfully responsible for the unjust treatment. Importantly, malicious and non-malicious envy differed with regard to their motivational foci and action tendencies. Whereas malicious envy seemed to motivate damaging behavior towards the other person, the focus of non-malicious envy seemed to be restricted to the improvement of one's own position. Thus, based on these findings, one might speculate that the frustrated desire for a coveted object fuels both malicious and non-malicious envy and the motivation to even out the difference to the rival. However, whereas non-malicious envy “levels things up, malicious envy levels them down” (Van de Ven et al., 2009, p. 428).

I second Rawls' (1971/1999) opinion that malicious envy “is what emulative [i.e., non-malicious] envy may become under certain conditions” (p. 467). Evolutionary considerations suggest that trying to enhance one's own position is a chief strategy to ensure competitive fitness (Buss, 1988) and possibly the default response when becoming aware of a superior rival. The alternative option to degrade the competitor (Buss & Dedden, 1990) not only seems much riskier but also does not lead to an improvement relative to other potential rivals. What determines whether envy only

motivates to improve oneself or shifts its focus to become malicious is yet to be determined. The many possible moderators include characteristics of the envious person (e.g., the intensity of his or her frustration, as argued by Rawls, 1971/1999), the envy evoking stimulus (e.g., whether it is at least potentially attainable for the envier or not, as in the case of a unique object or a fixed personal attribute), and of the rival (e.g., whether he or she is perceived to have caused the inferiority of the envier, see Parrott, 2001). While certainly being a very interesting question and worthwhile field of research, it is beyond the scope of the current investigation. For the present purposes, it will suffice to say that the central motivational force underlying envy seems to be the frustrated and intensified desire for the object or attribute possessed by another person that may, but does not necessarily lead to malicious reactions.

## Impulse and Self-Control in Envy

*Die Regungen des Neides liegen (...) in der Natur des Menschen, und nur der Ausbruch derselben machen sie zu dem scheußlichen Laster*

—Immanuel Kant, *Metaphysik der Sitten* (1797, p. 134)

Envy is often portrayed as the outcome of an impulsive reaction towards the superior fortune of others (e.g., Kant, 1797; Klein, 1957; Schoeck, 1971; R. H. Smith & Kim, 2007). For example, the medieval Christian philosopher Thomas Aquinas saw envy caused by an instinctive, spontaneous impulse, the “*motus invidiae*”, which is “a passion of sensuality (...) an imperfect human act where reason does not intervene” (cited in De la Mora, 1987, p. 29). According to Aquinas, only giving in and acting

upon this impulse should be considered a vice. In other words, he believed that people are able to (and should) control their spontaneous envious reactions. For several reasons, it is indeed likely that they will often try to do so. First of all, envy and its expression violate social norms (Foster, 1972; but see, Matt, 2003). In addition, other motives for emotional self-regulation<sup>2</sup> (Fischer, Manstead, Evers, Timmers, & Valk, 2004) are probably highly relevant in the case of envy, too. As outlined above, envy is a very unpleasant emotion; it contains intense frustration and is painful, thus, people should be hedonically motivated to do something about it. Furthermore, envy threatens the positive self-views that people strive to maintain (Tesser, 1988). That is why people will likely try to control not only their overt behavior but also their inner thoughts and feelings. In line with this view, neuroimaging studies have shown activation of brain areas related to emotional control as a response to unfavorable social comparisons (Joseph, Powell, Johnson, & Kedia, 2008).

Even though the notion that self-regulatory efforts are important to understand envy has not yet been addressed directly, it is implicitly contained in many accounts of this emotion. For example, Elster (1999) observes that envy “is normally suppressed, preempted, or transmuted to some other emotion” (p. 165). It has also been argued that this may be an important reason why it is so difficult to trace envy empirically: Envy “by its very nature, is obstinate in its opposition to investigation. The protean character of envy and its talent for disguise probably account for the infrequency of studies on the

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<sup>2</sup> Following the example of Vohs and Baumeister (2004), I use the terms „self-control“ and „self-regulation“ interchangeably.

subject” (Farber, 1966, p. 36). Similarly, according to R. H. Smith and Kim (2007, see also Parrot, 2001) envy is “an emotion that is best understood as an episode unfolding in time”, because envy’s “incipient feelings start a process that can take different paths as the envying person copes with the threatening nature of the emotion” (R. H. Smith & Kim, 2007, p. 56).

From these descriptions of the workings of envy, it seems reasonable to apply the perspective of the dual process models of psychological functioning. Historic (e.g., Aristotle, trans. 1929) as well as contemporary conceptualizations of the human mind (for reviews, see e.g., Chaiken & Trope, 1999; Evans, 2008) see behavior determined by joint effects of automatic and controlled<sup>3</sup> processes. Automatic processes are assumed to be fast, unintentional, effortless, and are believed to rely on associations and the high capacity of “lower order” cognitive systems. In contrast, controlled processes are described as slow, deliberative, as depending on effort and on a limited capacity of “higher order” cognitive systems, and are believed to generate behavior and decisions based on knowledge, facts, values, and social norms (Chaiken & Trope, 1999; Evans, 2008). The idea that emotion is closely tied to the first – the impulsive – system is put forward in several works that analyze how decision making and behavior is influenced by emotions as contrasted to the influence of more deliberate reasoning (e.g., S. Epstein,

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<sup>3</sup> Besides the terms automatic and controlled (Schneider & Shiffrin, 1977), other denotations have been proposed, for example, heuristic and systematic (Chaiken, 1980), associative and rule-based (E. R. Smith & DeCoster, 2000), spontaneous and deliberative (Fazio, 1990), experiential and rational (Epstein, 1994), hot and cold (Simon, 1983), impulsive and reflective (Strack & Deutsch, 2004) with largely overlapping but partly different meanings (see e.g., Evans, 2008).

1994; Evans, 2008; Hassin, Uleman, & Bargh, 2004; Haidt, 2001; Metcalfe & Mischel, 1999; Vohs, Baumeister, & Loewenstein, 2007).

A particular way in which automatic processes influence behavior is spelled out in Strack and Deutsch's (2004) reflective impulsive model. Referring to social cognitive and neuroscience evidence, Strack and Deutsch argue that the behavioral impact of cognitive schemata activated in the "impulsive system" is mediated by two motivational orientations towards environmental stimuli: approach and avoidance (see e.g., Cacioppo, Priester, & Berntson, 1993; Lang, Bradley, & Cuthbert, 1990; Sutton & Davidson, 1997). An approach orientation is "the preparedness to decrease the distance between the person and an aspect of the environment" (Strack & Deutsch, 2004, p. 231), including "physical locomotion, instrumental action, consumption, or the imagination thereof" (p. 231). In contrast, an avoidance orientation is geared towards increasing the distance to the environmental stimulus in question. Based on the observation that an intense longing for the superior object (or attribute) seems to be the most central aspect of envy, I hypothesize that the initial impulse of envy is to approach the envy object.

A dual process view is also inherent in many theories on the generation of emotion, particularly in those that belong to the family of appraisal models (for overviews, see e.g., Barrett, Ochsner, & Gross, 2007; Scherer, Schorr, & Johnstone, 2001). According to these models, emotions are based on how people appraise a given situation. The appraisal, i.e., the cognitive pattern of the situational construal, triggers the emotional response. Frijda (1986, 1988) describes this in his "law of situational meaning", according to which different emotions arise in response to specific meaning



structures of events in a predetermined way. Importantly, the situation is not assumed to directly elicit an emotional response. Rather, the effect of an emotional stimulus is mediated by cognitive processing, which then elicits the emotion in a largely automatic fashion. Appraisals reflect how the immediate external environment of people is related to their inner beliefs, values, goals, and concerns. Appraisal theorists hold that people continuously and automatically assess the personal relevance of situations (e.g., Roseman, 1984; Scherer, 1984; C. A. Smith & Ellsworth, 1985). In more recent conceptualizations, controlled processing is usually assumed to be able to affect these processes to some extent and interact with automatic appraisals in shaping the emotion (Clore & Ortony, 2000; Frijda & Zeelenberg, 2001; C. A. Smith & Kirby, 2001). Particular importance of reflective operations is seen in attempts to regulate the emotional response (cf., Barrett et al., 2007; E. R. Smith & Neumann, 2005).

### *Automaticity (and Mental Control) of Social Comparisons*

The emotional meaning structure of envy derives from a social comparison with a superior other. Psychological research has demonstrated that social comparison is a fundamental and ubiquitous element of human cognition (Festinger, 1954; Mussweiler, 2003; Suls & Wheeler, 2000). Consequentially, comparative processing has been shown to be a highly trained and efficient cognitive operation (Mussweiler & Epstude, 2009).

Whenever social information is processed, this information seems to be compared to salient comparison standards. For example, when forming a judgment about another person, people spontaneously compare this person to themselves

(Dunning & Hayes, 1996). Similarly, when people think about themselves they spontaneously compare with other people (Mussweiler & Rüter, 2003), even when these comparison standards have been presented outside of conscious awareness (Blanton & Stapel, 2008; Mussweiler, Rüter, & Epstude, 2004).

The human proclivity to engage in comparison is so pervasive that also when another person is clearly not a relevant comparison standard, people involuntarily compare. Most informative in the present context is research of Gilbert, Giesler and Morris (1995), in which participants saw a confederate perform better or worse in a psychological test than themselves. Additionally, while being exposed to the comparison information, the mental capacity of some participants was depleted by having to rehearse an 8-digit number. In this experimental condition, participants' self-evaluation was affected by their neighbor, even though these comparison standards were irrelevant because they had received additional training. In contrast, participants without cognitive load were able to correct the biasing influence of the non-diagnostic comparison. The authors conclude that people compare "even when they don't really want to, and when that happens, they may have little choice but to mentally undo the comparisons they made. Such efforts are not always successful" (pp. 232-233).

Thus, while people may engage in deliberate and effortful comparisons (Festinger, 1954), much social comparison activity can be assumed to occur spontaneously, without intention, and without effort. Therefore, I contend that when people are confronted with a superior other, they will engage in comparison as a default,

and subsequent cognitions, emotional responses, and behavior may be shaped by the outcome of this comparison, unless, they are able to control its influence.

### ***Controlling Envy***

People can deliberately control their emotional responding by employing a wide variety of strategies. According to an influential model of emotional regulation, the timing of attempts to regulate emotional responding is crucial to understand their mode and their consequences (Gross, 1998a, 1998b; Ochsner & Gross, 2005). *Antecedent-focused emotion regulation* is enacted early during the generation of the emotion or even before an emotion unfolds. For example, people can strategically select situations (e.g., avoiding to see the neighbor's new car). They can also try to modify the situation (e.g., purchase a new car themselves). Once they are in an emotional situation, they can influence which aspects of the situation they attend to (e.g., by distracting themselves from or by focusing on a specific emotional trigger). After the situation has been selected and attended to, people can try to change the way they think about it, for instance, in terms of their capacity to cope with the demands of the situation. A form of cognitive change that has received much empirical attention is reappraisal, which is aimed at altering the emotional impact of specific stimuli by changing their meaning. Reappraisal has been shown to be effective in altering affective, cognitive, and psychophysiological consequences of emotional stimuli (Gross, 1998a, 1998b, 2002). Once the emotional response has fully unfolded, people can engage in *response-focused emotion regulation* to lower (or amplify) their physiological, experiential, or behavioral

responding, for example, by trying to suppress emotion-expressing behavior, or by using relaxation techniques.

As alluded to above, in the case of envy, emotion regulation processes are often implicitly assumed to play a very important role, be it the often described transmutations of envy into other, morally legitimate emotions such as “righteous” resentment (an example of a reappraisal process), or the vigorous efforts to hide the envy from others (an example of emotional suppression). Attempts to alter the negative experience of envy or to inhibit its expression may be responsible for yet another phenomenon that is related to envious desire and seems thus to be particularly relevant for the present work. To reiterate, a central assumption underlying this research is that the intense longing for something one lacks is at the core of experiencing envy. Apparently however, the superior good or characteristic of another person is not always valued highly. Rather, the perception of someone superior may lead to outright disparagement of the potentially envy-evoking stimulus. Such a denigration of an envy-attribute can be illustrated by a memorable description of the narrator's great-aunt in Proust's novel *Swann's Way*: “Whenever she saw in others an advantage, however trivial, which she herself lacked, she would persuade herself that it was no advantage at all, but a drawback, and would pity so as not have to envy them” (cited in Taylor, 2006, p. 44). A devaluation of something desirable one is aware of but cannot attain is idiomatically referred to as “sour grapes”, alluding to Aesop's fable in which the Fox despises some high hanging grapes as sour because he is unable to reach them. Thus, the human capacity for reappraisal or, more specifically, rationalization (e.g., Elster, 1985, 1999; Kay, Jimenez, & Jost, 2002; McGuire & McGuire, 1991) may often be at work in

potentially envy-evoking situations. The fact that the metaphor “sour grapes” is sometimes misused as a synonym for envy (Garner, 1998) might point to the importance of this phenomenon in such situations.

The great-aunt in *Swann’s Way* escapes the harm of being aware of someone with a superior fortune by convincing herself that the enviable characteristic is in fact something negative. Elster (1985, 1999) discusses the cognitive and behavioral consequences of situations in which people are reminded that they are unlikely to attain something they desire as a special case of dissonance reduction (Festinger, 1957). To reduce the tension resulting from such a situation, people may change the world or simply accept that the world is not the way they want it to be. They might also pursue wishful thinking and imagine that they have in fact fulfilled their desire. Finally, they might engage in a rationalization strategy that Elster (1985) calls “adaptive preference formation”, in which they change their preferences to cease to desire what they originally wanted or even to despise it. The latter notion is what he equates with “sour grapes”. One might also expect the use of the complementary rationalization strategy “sweet lemons” (e.g., Kay et al., 2002; McGuire & McGuire, 1991), according to which the perceived desirability of the own (originally “bitter”) outcome is intentionally increased.

However, in addition to rationalization, other mechanisms might also lead to the expression of negative evaluations of an unattainable stimulus and thus to “sour grapes”. Impression management (e.g., Tedeschi, Schlenker, & Bonoma, 1971; Tesser & Paulhus, 1983) is a prime candidate, particularly in situations that may potentially

evoke envy: People might publicly express disdain for the superior fortune of another person in order to convince others that their status remains superior or at least equal to their rival, leaving open the possibility that they privately still desire the stimulus.<sup>4</sup>

To conclude, people are by no means doomed to be envious or to act on their envious impulses. To evade or counter the effects of a potentially envy-evoking situation, they may engage in emotion regulation, using a variety of different ways. Accordingly, even though a central component of envy seems to be the increased desire for the superior fortune of another person, this desire will not always dominate behavior. In fact, situations that may potentially give rise to envy may also result in the expression of a negative evaluation of this fortune.

### ***Moderators of Impulsive and Reflective Behavior Determination***

From a dual process perspective, the cognitive, emotional, and behavioral outcome of an envy situation depends on the interplay of automatic and controlled processes. An important question is what determines whether the envious impulse will

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<sup>4</sup> Rationalization is a mechanism that fits the description of what social cognition researchers call motivated reasoning, which entails the selective processing of information to arrive at particular conclusions (e.g., Kay et al., 2002; Kruglanski, 1996; Kunda, 1990). Clearly, impression management is also the result of motivated social cognition. To be sure, it is also conceivable that an object or quality that has evoked envy may be regarded as less positive or even acquire negative valence without being the direct objective of a motivational process, however. For example, a less positive evaluation might result from evaluative conditioning (e.g., De Houwer, 2007), as the object or quality is paired with a very negative emotional experience.

prevail or whether it will be tamed by reflective operations.<sup>5</sup> A first precondition for the latter possibility is the motivation to control envy. Evidence supporting the role of motivation for the deliberate inhibition of automatic responses stems from research on prejudice, which shows that motivation moderates the relationship between automatic attitudes and self-reported judgments (M. Olson & Fazio, 2004) and behavior (Dasgupta & Rivera, 2006). As argued before, because envy is a negative emotion in several respects, people should be highly motivated to regulate it.

If people are motivated to exert self-control in an envy-provoking situation, a conflict between automatic and controlled determinants evolves. Now, another important precondition becomes relevant: People need the capability to exert self control. A growing body of research has identified dispositional and situational factors that affect whether people are successful at resisting their impulses and in altering emotional responding (Baumeister & Vohs, 2004; Hofmann, Friese, & Strack, 2009). For example, the capacity to exert self-control has been shown to be a resource that can be depleted, such that exerting self-control in one task disrupts people's ability to engage in self-control in subsequent tasks (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Vohs & Heatherton, 2000). In a related vein, self-control performance is also hindered by concurrent manipulations of mental capacity, such as cognitive load, time

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<sup>5</sup> In line with most of the research on this topic, I equate emotion regulation with deliberate processing. However, it has to be acknowledged that emotion regulation can be automatized (Mauss, Bunge, & Gross, 2007). This should particularly be the case if an individual has repeatedly used a regulatory strategy in a given situation (Bargh & Williams, 2006), but automatization can also be created strategically (Schweiger Gallo, Keil, McCulloch, Rockstroh, & Gollwitzer, 2009).

pressure, emotional distress, low blood sugar level, or alcohol intoxication (for a review, see Hofmann, Friese, & Strack, 2009).

A common element of many of these factors has been speculated to be the impairment of executive working memory functions (Hofmann et al., 2009). Evidence supporting this assertion is provided by research that relates interindividual differences in working memory capacity to self-control ability. For example, in a study by Schmeichel, Volokhov, and Demaree (2008), participants with higher working-memory capacity were better in suppressing negative emotions, had a higher capability to appraise emotional stimuli in an unemotional manner, and consequentially were less affected by them (see also Hofmann, Gschwendner, Friese, Wiers, & Schmitt, 2008). Experimental evidence stems from research showing that controlling emotions has detrimental effects on the resources needed for higher-order cognitive functioning (Baumeister et al., 1998; Richards & Gross, 2000). For instance, Schmeichel (2007) found that regulating emotion reduced working memory span in a subsequent task. Finally, there is research showing that cognitive load hinders emotion regulation. For example, participants of Wegner, Erber, and Zanakos (1993) were unable to alter their emotional state while rehearsing a complicated number. Relatedly, participants' emotional state had a stronger impact on judgments when mental capacity was reduced by a similar cognitive load manipulation (or time pressure) in a study by Siemer and Reisenzein (1998). Thus, people should be most likely to feel envy and act on their envious impulse, when their mental capacity to exert self-control is taxed.



## The Present Research

The main theoretical arguments and hypotheses of this dissertation can be summarized as follows: Because social comparisons are carried out effortlessly and without intention, even with irrelevant comparison standards, I argue that becoming aware of others who possess a superior good produces a spontaneous envy reaction. Furthermore, based on experiential envy research and evolutionary theory, I contend that a core element of envy is the intensified and impulsive desire for the superior good, which should be reflected in judgments about it and behavior directed at it, such as automatic approach behavior or spontaneous purchases. However, because envy is affectively and normatively a negative emotion, people should be highly motivated to control their emotional responses. For this reason, envy and its affective, cognitive, and behavioral consequences should be only evident in situations in which people's ability to exert self-control is hindered.

Thus, all other things being equal, people whose mental capacity is constrained while facing a better-off neighbor should feel more discontent and anger about their outcome, and report to be more envious than those who do not face a better-off neighbor. Furthermore, only when facing a better-off neighbor they should be willing to pay more for the good they are deprived of, they should be more inclined to purchase this good, and should show signs of a stronger automatic approach tendency towards it. In contrast, when people have the mental means to regulate their emotional response, there should be no evidence of increased envy and desire. The use of some specific

emotion control strategies may even result in a negative evaluation of the superior good, and thus in signs of “sour grapes”.

## Empirical Evidence

### Overview

The aim of the presented research was to investigate experimentally whether envy and the desire for another's superior good are more intense when the capacity to exert self-control is constrained. To induce envy, a seemingly innocuous treatment was used in all four studies: Participants in the crucial experimental condition were deprived of an attractive food that an experimental partner was about to taste. This experimental condition was compared to conditions in which participants were deprived of the attractive food as well but were alone, or to conditions in which participants had an experimental partner who was endowed equally or was worse-off.

Experiment 1 was conducted in a field setting and tested whether the level of alcohol intoxication was related to the intensity of the negative emotional reaction in response to the envy evoking experimental condition. Experiments 2 to 4 investigated the impact of cognitive load on envious responding in a laboratory setting. Experiment 2 tested whether high cognitive load would lead to more envy and a higher willingness to pay for the envy evoking object. Experiment 3 extended this investigation to actual spontaneous purchasing behavior. Finally, Experiment 4 employed a response latency based measure of impulsive approach behavior to provide direct evidence for the increased inclination to acquire the envy-evoking stimulus.

## Experiment 1

In the first Experiment, I examined how alcohol intoxication is related to the intensity of the emotional response in an envy-provoking situation. I hypothesized that alcohol impairs self-control and thus, leads to a stronger emotional response when faced with a better-off neighbor.

This conjecture can be substantiated by much research on the psychological and pharmacological effects of alcohol intoxication, which has demonstrated that alcohol leads to dysregulated behavior across a wide variety of domains (for a meta-analysis see Hull & Bond, 1986). Pharmacological explanations of alcohol effects emphasize alcohol's limiting influence on attentional capacity (Steele & Josephs, 1990) and its impact on brain areas related to self-control (Lyvers, 2000). In this vein, amounting evidence shows that alcohol affects emotions primarily by its effect on higher information processing centers that participate in "top-down" regulation of emotional responses (Curtin & Lang, 2007). Relatedly, it has been demonstrated that alcohol influences psychological functioning pharmacologically by impairing executive control processes such as response inhibition, while leaving bottom up processes such as the activation and implementation of responses intact (Curtin & Fairchild, 2003; Fillmore & Vogel-Sprott, 1999). Psychological explanations stress the role of expectancies in alcohol effects. According to this view, alcohol can change the perception of social norms, such that people think that it is permissible to violate social norms when being drunk because alcohol itself offers the excuse for doing so (Marlatt & Rohsenow, 1980). In line with both accounts, acute alcohol intoxication has diverse judgmental and

behavioral consequences related to the failed inhibition or correction of automatic responses. For example, alcohol disrupts the conscious inhibition of impulsive determinants of food consumption (Hofmann & Friese, 2008), hinders the reflective adjustment of intuitive judgments (Epley & Gilovich, 2006), leads to greater behavioral change in response to salient environmental cues (MacDonald, Fong, Zanna, & Martineau, 2000), and can foster aggressive behavior in response to provocations (Giancola & Corman, 2007). Therefore, I hypothesize that alcohol intoxication does not alter the spontaneous emotional reaction in a situation that is likely to evoke envy. However, alcohol should impair the ability or the motivation to consciously control the envious response.

To recruit participants who varied in their level of alcohol intoxication, passers-by were approached during the climax of the Cologne carnival, which involves drinking for many revelers. Under the guise of research on taste judgments, participants were invited to take part in a taste test involving two differentially attractive candies, an unattractive chewy candy and an attractive box of chocolates. All participants were asked to taste the unattractive candy and were thus deprived of the attractive candy. In the better-off neighbor condition, they did so in the immediate presence of a confederate who tasted the attractive candy. In the no-neighbor condition, they did so without the presence of a confederate. Given that participants in this condition knew that other participants would receive the chocolate, they could in principle have become envious too. However, because social comparisons with specific other persons have a greater impact (Buckingham & Alicke, 2002), I expected envy most likely to occur in the better-off neighbor condition. Subsequently, participants responded to items assessing

the intensity of their negative emotional experience. Finally, participants' blood alcohol concentration (BAC) was measured with a breathalyzer.

## ***Method***

### *Participants and Design*

Participants were 38 people (20 females, 17 males; age 18 to 38; 1 missing value) who – during the Cologne street carnival – passed by the main university cafeteria, which is located closely to a popular carnival party spot. They were assigned to a better-off neighbor condition or a no-neighbor condition. Measured BAC served as a quasi-experimental variable.

### *Procedure*

Participants were invited to a “taste test of candy” aimed at studying the “influence of mood and alcohol consumption on taste judgments.” The experiment was conducted in the form of a standardized interview and the responses were audio-recorded. To lend credibility to the cover story, participants were asked to indicate their current mood and how many alcoholic beverages they had drunk that day. This data was not analyzed. Participants were then told that they would taste one of two different sorts of candy, which were shown to them: A box of brand chocolate confection (*Nestlé Choco Crossies*) and a single piece of no-name chewy candy. The chocolate was

superior in terms of size, objective value, and desirability<sup>6</sup>. The experimenter added that for sanitary reasons they would receive a fresh box if they were assigned to taste the chocolate and that they could keep the rest of it.

In the better-off neighbor condition, participants were told that the taste tests would be conducted in pairs, and pointed to another participant (a confederate). The experimenter explained that in order to rule out the influence of individual taste preferences and effects of the daytime, the products would be assigned randomly by drawing lots. The participant was asked to choose one of two paper slips, unfold it, and read out loud what was written on it. Unbeknownst to the participants, both paper slips read “Chewy Candy”. While the participant read out his or her lot, the confederate unfolded the second paper slip and responded “*Choco Crossies*”.

In the no-neighbor condition, participants were also assigned to taste the chewy candy (and not the chocolate) offering the same explanation and using the same procedure (ostensible lottery), with the sole exception that they were not paired with

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<sup>6</sup> A pretest was conducted to select pairs of foods differing in their desirability. Thirty people who were leaving or entering the university cafeteria were recruited to complete a short questionnaire. They were asked to indicate how strongly they would like to eat or drink each of a series of different foods at this moment. Participants provided desirability ratings on 9-point scales ranging from 1 (“not at all”) to 9 (“very much”). For Experiment 1, “*Choco Crossies*” (a chocolate confection;  $M = 5.30$ ,  $SD = 2.71$ ) was selected as superior product in combination with the comparatively less desirable “chewy candy” ( $M = 3.83$ ,  $SD = 2.44$ ),  $t(29) = 4.17$ ,  $p = 10^{-4}$ . For Experiment 2, “*Häagen-Dazs* ice cream” ( $M = 7.20$ ,  $SD = 2.19$ ) was selected as superior product in combination with the comparatively less desirable “*Leibniz* butter biscuit” ( $M = 5.13$ ,  $SD = 2.58$ ),  $t(29) = 4.15$ ,  $p = 10^{-4}$ . For Experiments 3 and 4, “smoothie” ( $M = 5.43$ ,  $SD = 2.74$ ) was selected as superior product in combination with the comparatively less desirable “sauerkraut juice” ( $M = 1.93$ ,  $SD = 1.76$ ),  $t(27) = 7.19$ ,  $p = 10^{-7}$ . Different degrees of freedom are due to missing values.

another participant and that no reference to other participants was made during the assignment.

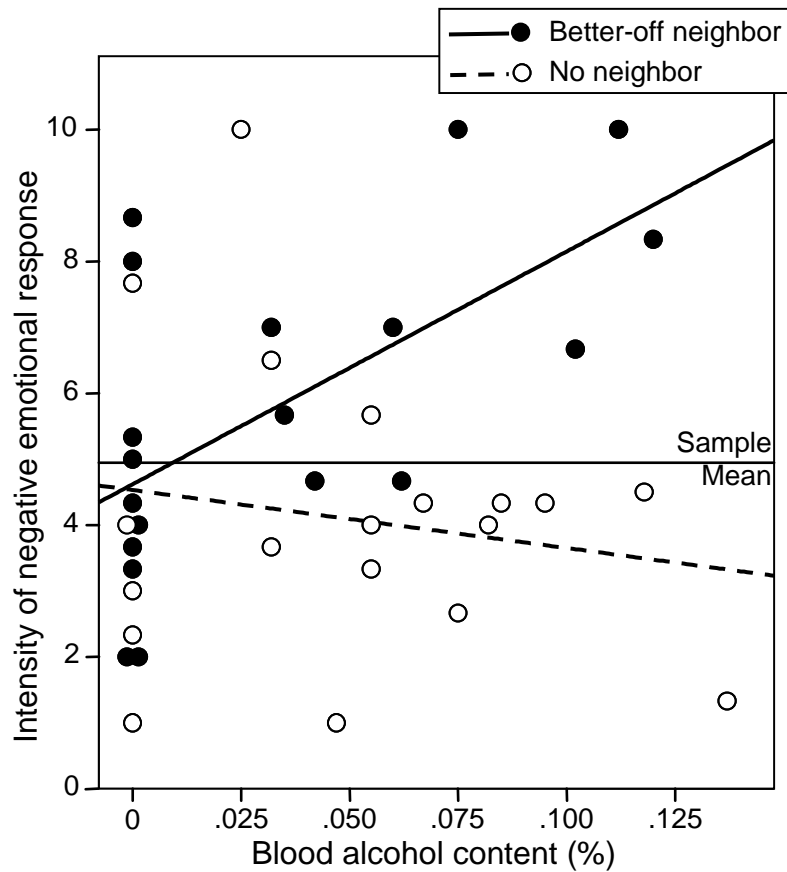
To assess the intensity of their emotional response, all participants first rated how happy they were about receiving the chewy candy (reverse coded), then how angry they were about not receiving the box of chocolate, and finally how strongly they envied the persons who received the box of chocolate on 10-point scales (1 = not at all, 10 = extremely). The ratings were internally consistent (Cronbach's  $\alpha = .74$ ), and thus averaged to a single emotional response index. Participants then tasted the chewy candy and indicated how much they liked the taste of the candy on a 10-point scale (1 = not at all, 10 = extremely good). Finally, participants' BAC was measured by an ACE3000 (ACE GmbH, Freilassing, Germany) breathalyzer. Before the measurement, participants rinsed their mouths with water to remove residual alcohol. A new disposable mouthpiece was used for each participant. At the end, every participant received a box of chocolate as unannounced compensation.

### ***Results***

The dependent variable of this Experiment was the intensity of the negative emotional reaction in response to not receiving a more desirable product in the taste test. I hypothesized that participants who were facing a better-off neighbor would react more negatively the more intoxicated they were. In contrast, for participants who were alone, I did not expect the negative emotional response to covary with the level of intoxication. Participants in this condition should be hardly envious and respond, at most, mildly negative to being deprived of the somewhat superior good. Hence, they should be less



inclined to engage in emotional self-control and should therefore be less affected by the impairing effects of alcohol intoxication.



*Figure 1.* Intensity of participants' negative emotional response after not receiving a superior product on a scale from 1 (none) to 10 (extremely) as a function of BAC (percent by volume) and experimental condition (Experiment 1;  $n = 19$  per experimental condition). The lines depict the simple regression slopes of the better-off neighbor and no-neighbor participants.

As shown in Figure 1 and in line with the predictions, the more intoxicated participants were, the more negatively they reacted to not being assigned to taste the more desirable food in the better-off neighbor condition,  $r(19) = .62$ ,  $p = .01$ .

Importantly, in the no-neighbor condition, this was not the case,  $r(19) = -0.16$ ,  $p = .50$ . To analyze this pattern, neighbor condition (better-off neighbor condition dummy coded with value 1, no-neighbor condition coded with 0), BAC and a neighbor  $\times$  BAC interaction term were entered in a multiple regression predicting the negative emotional response. The regression resulted in a significant neighbor  $\times$  BAC interaction,  $\beta = .62$ ,  $t(34) = 2.63$ ,  $p = .01$ . The neighbor and BAC main effects were not significant  $|ts| < .73$ ,  $ps > .47$ .

For exploratory reasons, I also analyzed the taste judgments. If participants coped with experimental situation by rationalizing their outcome, a “sweet lemons” effect might emerge for those participants who had the cognitive means to do so at their disposal. Thus, one could expect a negative correlation of the taste judgment and participants’ BAC, particularly in the better-off neighbor condition due to its higher potential for negative affective reactions. However, the correlation of taste judgment and BAC was neither significant in the better-off neighbor condition,  $r(18) = -.19$ ,  $p = .45$ , nor in the no-neighbor condition,  $r(18) = .01$ ,  $p = .97$ . The corresponding regression analysis did not yield interactions or main effects for neighbor condition and BAC,  $|ts| < .61$ ,  $ps > .55$ .

### ***Discussion***

The results of Experiment 1 confirm that discontent with an inferior outcome is particularly likely when encountering a better-off other while self-control resources are taxed. The more intoxicated they were, the more negatively participants in the better-off neighbor condition reacted (as indicated by a measure combining their unhappiness

about the inferior food, their anger about not receiving the superior food, and their envy).

Given the present experimental design, it is not possible to estimate the relative contribution of pharmacological and/or expectancy effects of alcohol consumption to this result. As contended before, the possible violation of social norms is not the only reason to control envy. People should also be motivated to control envy in order to avoid the negative hedonic state and maintain a positive self-view. One might argue that both of the latter motivations are less likely to be altered by alcohol expectancy effects. However, in order to elucidate the degree to which a physiologically diminished ability to engage in self-control, motivational deficits, or both are responsible for the more negative reaction, a balanced placebo design (Hull & Bond, 1986) – in which alcohol dose and presumed alcohol consumption are orthogonally varied – would be needed. Within the scope of the present research, it may be sufficient to say that because people are usually aware of the fact that they have consumed alcohol, the comparison of people differing in self-induced alcohol intoxication reflects the ecological validity of the findings.

The analysis of the taste judgments did not support the notion that participants' efforts to cope with the envy-evoking situation resulted in a "sweet lemons" effect. There was no significant negative relationship of taste judgments and BAC in the better-off neighbor condition, as one could predict if participants used this particular rationalization strategy. The absence of this finding might be due to the small sample size (a problem that was aggravated by several missing values in this measure).

However, participants may also have responded to the envy-evoking situation by using a different coping strategy, leaving their evaluation of their inferior food unchanged.

Of course, the quasi-experimental design of Experiment 1 poses challenges to the internal validity of the findings. Participants varying in alcohol intoxication may have differed in other psychological variables too. In the remaining studies, full experimental designs were used in a more controlled laboratory setting. To tax participants' capacity to exert self-control, a cognitive load manipulation was employed in Experiments 2, 3, and 4.

## Experiment 2

Having established that spontaneous negative social comparisons lead to envy under conditions that foster disinhibited responses, Experiment 2 explored whether evoked envy would heighten the inclination to acquire the superior good. If becoming aware of a better-off other leads to envious desire for the envied good, people should be willing to spend more money for the superior good, especially, when they are not able to control their envious reaction.

Pairs of unacquainted participants were invited to perform taste judgments in the laboratory. To tax their mental resources, a standard cognitive load manipulation (Gilbert et al., 1995; Gilbert, Pelham, & Krull, 1988) was used. In the high load condition, participants had to remember a difficult 8-digit number. In the low load condition, this number was easy to remember. Participants in the better-off neighbor condition were assigned to taste a small package of butter biscuits, while their neighbor

(who was in the worse-off-neighbor condition) was assigned to a more desirable ice-cream sundae. Participants in the equal-neighbor condition were assigned to test both foods, as did their partner – only in a different order. Before they tasted the foods, participants rated how strongly they envied their experimental partner and indicated their willingness to pay for each of the two products.

I predicted that participants should be most envious in response to having a neighbor with a superior food when experiencing high cognitive load. Those participants should also be willing to pay more for the ice cream than participants in the remaining experimental conditions. Furthermore, given that I hypothesized a causal relation of envy and the inclination to acquire the desired good, envy should statistically mediate the effect of the neighbor condition on the amount of money participants are willing to pay for the ice cream. Because participants in the low load condition are likely to control their envious response, this mediation should be limited to participants in the high load condition.

## ***Method***

### *Participants and Design*

Participants were 116 adults (82 female, 27 male; age 20 to 44; 9 missing demographics values) who had been approached at a campus of the University of Cologne or recruited from a pool of undergraduate students who had given their approval to be contacted for requests to participate in psychological studies. They were assigned to a 3 (neighbor: better-off vs. equal vs. worse-off)  $\times$  2 (cognitive load: high vs. low) between subjects design. They received 4 Euro as compensation.

*Procedure*

Pairs of unacquainted participants were invited to participate in a study about “factors that affect product evaluations and taste judgments”. They were seated in front of two adjacent computers at a distance of about 2 m. The computers were used to present the instructions and measures. To lend credibility to the cover story, participants were asked to indicate how much time had passed since their last meal. Furthermore, they rated the strength of their hunger, of their thirst, and of their appetite for several categories of food. This data was not analyzed. Then, participants saw pictures of the two foods to be tasted and formed an impression of them: A sundae of *Häagen-Dazs* ice cream and a package of *Leibniz* butter biscuits. While the biscuits were relatively attractive, the ice-cream was more desirable (see footnote 6, p. 31).

Participants proceeded with the cognitive load manipulation, which was introduced as a means to discover how concentration affects food evaluation. In the high load condition, participants had to remember a difficult 8-digit number (“84734239”). In the low load condition, participants had to remember an easy 8-digit number (“11111111”).

Next, participants were informed that for randomization purposes the products would be simultaneously assigned to both of them by the computer. The assignment was then shown to them in a slot-machine-like animation, in which they saw their own outcome and the outcome of their experimental partner at the same time on their individual computer screens. In two thirds of the participant pairs, one participant was assigned to the biscuits and his or her experimental partner was assigned to the ice cream. This resulted in two experimental conditions: Participants who were assigned to

the biscuits (and their experimental partner to the ice cream) were in the better-off neighbor condition. Participants who were assigned to the ice cream (and their experimental partner to the biscuits) were in the worse-off-neighbor condition. In another third of the participant pairs, both experimental partners were assigned to taste both the ice cream and the biscuits. In this third condition—the equal-neighbor condition—only the order of the taste tests of the two products varied among the two experimental partners, one tasting the biscuits first and then the ice-cream and the other one tasting the ice cream first and then the biscuits.<sup>7</sup>

Then, participants were told that their preferences are another factor that affects product evaluation and that they should think about how they valued both products and whether they preferred one of the presented products. To assess their envy, participants were then asked to indicate, how strongly they envied their experimental partner on a scale ranging from 1 (“not at all”) to 7 (“very much”). After that, they were asked how much they would be willing to pay for the ice cream and for the biscuits. Before tasting the food(s), participants wrote down the 8-digit number they had to remember. In the taste judgment, they indicated on a 7-point scale how the food tasted (1 = very bad, 7 = very good). At the end, they were thanked and paid.

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<sup>7</sup> Given that the order in which participants were going to taste the two products in this condition did not affect any of the dependent variables in main effects, nor in interactions with cognitive load ( $F_s < 2.16$ ,  $P_s > .15$ ), further analyses are collapsed over both groups.

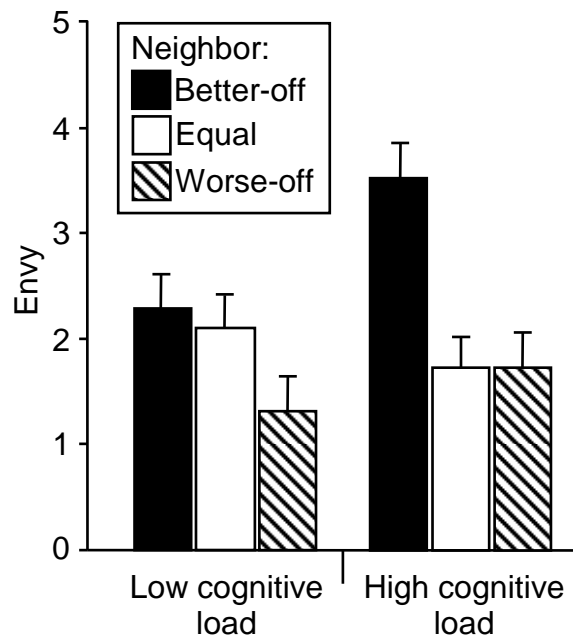


Figure 2. Mean envy towards the neighboring participant on a scale from 1 (not at all) to 7 (very much) as a function of neighbor and cognitive load conditions (Experiment 2). Error bars represent one standard error ( $n = 18$  to  $22$  per experimental condition).

## Results

### Envy

Inspection of the means in Figure 2 reveals that participants' envy was indeed affected by their and their neighbor's outcome and the cognitive load that was imposed on them. Specifically, the descriptively highest envy was reported by participants under high cognitive load in the better-off neighbor condition ( $M = 3.53$ ,  $SD = 1.98$ ). In comparison, high cognitive load participants in the equal-neighbor condition ( $M = 1.73$ ,  $SD = 1.08$ ) and the worse-off-neighbor condition ( $M = 1.72$ ,  $SD = .96$ ) expressed less envy. Low cognitive load participants expressed similar (low) amounts of envy in the better-off neighbor condition ( $M = 2.28$ ,  $SD = 1.84$ ) as well as in the equal ( $M = 2.10$ ,  $SD = 1.41$ ), and worse-off neighbor ( $M = 1.32$ ,  $SD = .75$ ) conditions.



The data was analyzed in a 3 (neighbor: better-off vs. equal vs. worse-off)  $\times$  2 (cognitive load: high vs. low) analysis of variance (ANOVA). The reported means corresponded to a significant two-way interaction,  $F(2, 110) = 3.28, p = .04$ , which qualified a neighbor condition main effect  $F(2, 110) = 9.59, p = 10^{-5}$  and a trend of a cognitive load main effect,  $F(2, 110) = 2.68, p = .10$ . Planned contrasts confirmed that within the high cognitive load condition, more envy was reported by participants in the better-off neighbor condition than by participants in the equal or worse-off-neighbor conditions,  $F(1, 110) = 21.20, p = 10^{-4}$ . Also, participants in the better-off neighbor condition expressed more envy when being under high cognitive load compared to those under low cognitive load  $F(1, 110) = 7.33, p = .008$ .

#### *Willingness to Pay*

As shown in Figure 3, participants' willingness to pay for the inferior (butter biscuits) and superior food (ice cream) also conformed to the predictions. Corroborating the different desirability of the foods, participants were willing to pay more money for the superior food ( $M = 2.68$  Euro,  $SD = 3.94$ ) than for the inferior food ( $M = .71$  Euro,  $SD = .86$ ).

As expected, participants having a better-off neighbor while being under high cognitive load expressed the highest willingness to pay for the ice cream ( $M = 5.06$  Euro,  $SD = 7.71$ ). In comparison, high load participants with an equal neighbor ( $M = 2.38$  Euro,  $SD = 2.90$ ) or a worse-off neighbor ( $M = 1.84$  Euro,  $SD = 1.07$ ) were willing to pay less. In contrast, descriptively, low load participants were willing to pay somewhat less for the ice cream in the better-off neighbor condition ( $M = 1.67$  Euro,

$SD = 1.04$ ) than in the equal ( $M = 2.50$  Euro,  $SD = 3.07$ ) or worse-off neighbor ( $M = 2.65$  Euro,  $SD = 3.16$ ) conditions.

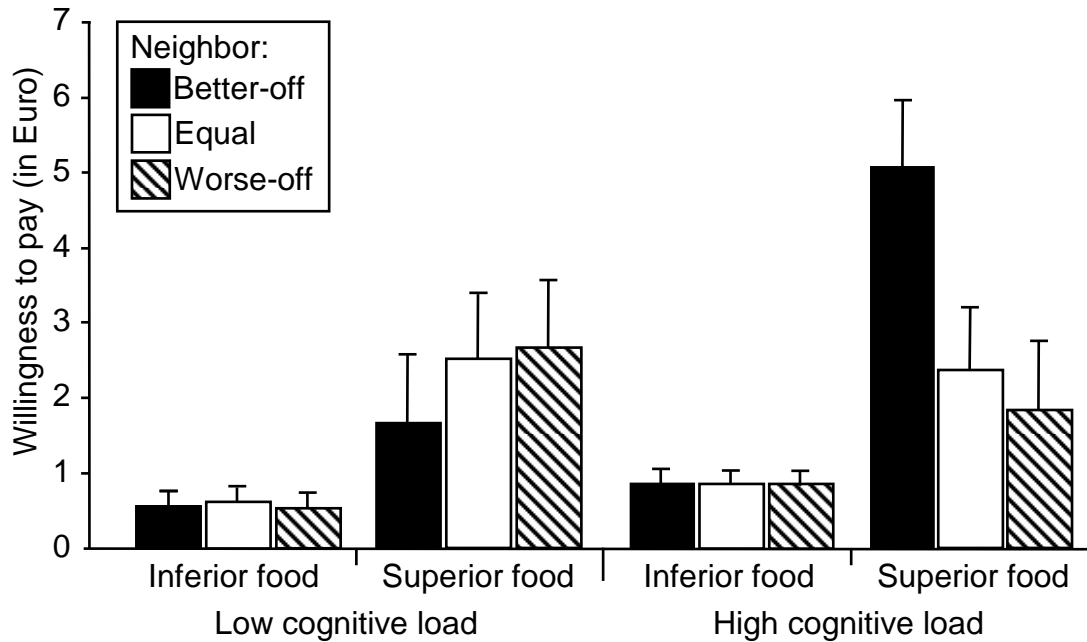


Figure 3. Mean willingness to pay (in Euro) for the inferior food and the superior food as a function of neighbor and cognitive load conditions (Experiment 2). Error bars represent one standard error ( $n = 18$  to  $22$  per between subjects condition).

Willingness to pay for the inferior food was higher in the high cognitive load condition ( $M = .85$  Euro,  $SD = 1.12$ ) than in the low cognitive load condition ( $M = .58$ , Euro,  $SD = .42$ ). Apart from that, willingness to pay for the inferior food was similar across experimental conditions (high load condition:  $M_{\text{better-off neighbor}} = .84$  Euro,  $SD = 1.10$ ;  $M_{\text{equal neighbor}} = .85$  Euro,  $SD = 1.02$ ;  $M_{\text{worse-off neighbor}} = .85$  Euro,  $SD = 1.31$ ; low load condition:  $M_{\text{better-off neighbor}} = .54$  Euro,  $SD = .46$ ;  $M_{\text{equal neighbor}} = .62$  Euro,  $SD = .49$ ;  $M_{\text{worse-off neighbor}} = .56$  Euro,  $SD = .28$ ).

This pattern produced a significant three-way interaction in a 3 (neighbor: better-off vs. equal vs. worse-off)  $\times$  2 (cognitive load: high vs. low)  $\times$  2 (food: inferior vs. superior) repeated measures ANOVA,  $F(2, 110) = 3.49, p = .03$ . In addition, the lower order neighbor  $\times$  load interaction was marginally significant  $F(2, 110) = 2.67, p = .07$ , and there was a main effect of food,  $F(1, 110) = 33.21, p = 10^{-7}$  (all other effects  $F < 1.92, ps > .17$ ).

Contrast analyses confirmed that under high load, participants reported a higher willingness to pay for the superior food in the better-off neighbor condition compared to the other neighbor conditions,  $F(1, 110) = 7.46, p = .01$ . Under low load, the descriptively reduced willingness to pay for the superior food in the better-off neighbor condition as compared to the other neighbor conditions did not approach statistical significance,  $F(1, 110) = .68, p = .41$ . Comparing the cognitive load conditions within the better-off neighbor condition, high load participants reported a higher willingness to pay for the superior food than low load participants  $F(1, 110) = 7.11, p = .01$ . Apart from a marginal load effect on the willingness to pay for the inferior food,  $F(1, 110) = 2.82, p = .10$ , it was not affected by the experimental manipulations ( $F_s < 1$ ).

### *Mediation Analysis*

To examine whether the joint effect of the presence of a better-off neighbor and high cognitive load on the amount of money participants were willing to pay for the superior food was statistically mediated by the experience of envy, I conducted a mediated moderation analysis following the guidelines of Muller, Judd, and Yzerbyt (2005; see also R. M. Baron & Kenny, 1986; Preacher, Rucker, & Hayes, 2007).

For the analysis, experimental conditions were contrast coded. In order to compare the better-off neighbor condition to the worse-off-neighbor condition and the equal-neighbor condition, the first was coded with the value 2 and the other two with the value -1. Cognitive load conditions were coded with the value 1 for high load and the value -1 for low load.

The mediated moderation analysis entailed three regression equations. In the first equation (the mediator model), neighbor, load, and the neighbor  $\times$  load interaction were regressed on the experienced envy (the mediator). This revealed a significant main effect of neighbor condition,  $\beta = .39$ ,  $t(112) = 4.21$ ,  $p = 10^{-4}$ , no effect of load,  $t(112) = 1.61$ ,  $p = .11$ , and a significant neighbor  $\times$  load interaction,  $\beta = .21$ ,  $t(112) = 2.22$ ,  $p = .03$ . In the second equation (the simple dependent variable model), neighbor condition, load, and the neighbor  $\times$  load interaction were regressed on the willingness to pay. This revealed only a significant effect of the neighbor  $\times$  load interaction  $\beta = .23$ ,  $t(112) = 2.51$ ,  $p = .01$  (main effects  $|ts| < 1.32$ ,  $ps > .19$ ).

In the third equation (the full dependent variable model), neighbor condition, cognitive load, and the neighbor  $\times$  load interaction were again regressed on the willingness to pay, however this time the experienced envy (the mediator) and an envy  $\times$  load interaction were added as predictors. This equation produced only a significant effect of envy,  $\beta = .28$ ,  $t(110) = 2.82$ ,  $p = .01$ . The envy  $\times$  load interaction was not significant,  $t(110) < 1.22$ ,  $p = .22$ . Importantly, the effect of the neighbor  $\times$  load interaction was reduced and rendered non-significant,  $\beta = .13$ ,  $t(110) = 1.38$ ,  $p = .17$ ; main effects  $|ts| < .59$ ,  $ps > .56$ .

These results indicate that experienced envy mediated the joint effect of a better-off neighbor and high cognitive load on the willingness to pay for the superior product. The first equation revealed that cognitive load moderated the effect of the neighbor on envy. Envy, in turn, predicted the willingness to pay for the superior product (third equation), reducing the joint effects of neighbor and load (compared to the second equation). This effect of envy on willingness to pay was not moderated by cognitive load. To elucidate these findings, I computed the conditional indirect effects at both high and low cognitive load. Envy mediated the effect of the neighbor conditions under high cognitive load ( $Z = 2.38, p = .02$ ), but not under low cognitive load ( $Z = .77, p = .44$ ).

### *Taste Judgments*

For exploratory reasons, the taste judgments were analyzed as well. Of theoretical interest in the present context are the judgments about the inferior biscuits, which were tasted by participants in the better-off neighbor condition and the equal-neighbor condition. In the high load condition, better-off neighbor participants perceived the inferior biscuits to taste better ( $M = 5.53, SD = 1.68$ ) than in the equal neighbor condition ( $M = 4.95, SD = 1.11$ ). In the low load condition, this was also the case ( $M_{\text{better-off neighbor}} = 5.44, SD = 1.15; M_{\text{equal neighbor}} = 4.90, SD = 1.33$ ). This pattern resulted in a marginal neighbor condition main effect in a 2 (neighbor: better-off vs. equal)  $\times$  2 (cognitive load: high vs. low) ANOVA  $F(1, 75) = 3.18, p = .08$ . No other effects approached significance,  $F_s < 1, p_s > .76$ .

### *Discussion*

The results of Experiment 2 support the hypothesis that envy and the desire for another's superior possession is particularly likely if mental capacity is taxed. Strongest envy was expressed by those participants in the high cognitive load condition who were assigned to taste the inferior biscuits while their neighbor was about to taste the superior ice cream. In line with the prediction that people who have the mental capacity to exert self-control at their disposal, participants in the low cognitive load condition did not report elevated levels of envy towards the better-off other.

Parallel results were obtained for the amount of money participants were willing to pay for the superior food. High cognitive load participants with a better-off neighbor reported the highest willingness to pay for the ice cream compared to participants who had a neighbor with an equal or worse outcome. In contrast, low load participants facing a superior other were not willing to pay more for the ice cream than participants who had a neighbor with an equal or worse outcome. Descriptively, they seemed to be willing to pay less for the superior ice cream when a better-off neighbor was present than in the other neighbor conditions. While in accord with the "sour grapes" hypothesis, according to which participants might rationalize their inferior outcome by disparaging the superior stimulus, this difference did not approach statistical significance.

Willingness to pay for the inferior food, the biscuits, was not affected by the neighbor conditions neither under high nor under low load, showing a) that the effect of the better-off neighbor in the high cognitive load condition was specific to the superior product and b) that there was no sign of a "sweet lemon" effect, which would imply an

increased willingness to pay for the inferior food in the low load condition. The absence of both the “sweet lemon” and “sour grapes” effect in the willingness to pay measure might be due to its insufficient sensitivity. Of course, participants might also have used other coping strategies than these particular forms of rationalization.

Unexpectedly, there was a trend towards a higher willingness to pay for the inferior product under high load. Possibly, this was an unintended side effect of the different numbers used in the cognitive load conditions. In the high load condition, the number and its digits (“84734239”) were higher than in the low load condition (“11111111”). Thus, the higher willingness to pay in this condition might be due to an anchoring effect (Tversky & Kahneman, 1974). However, given that participants’ willingness to pay for the inferior product was affected uniformly by load in the different neighbor conditions, this effect does not offer an alternative explanation for the interactive effects of neighbor and load conditions on the willingness to pay for the superior product.

Substantiating the view that the higher willingness to pay of high load participants in the better-off neighbor condition was caused by the intensity of their envious reaction, reported envy mediated the effect of the neighbor conditions on the willingness to pay under high cognitive load. Furthermore, the correlational evidence of the mediated moderation analysis suggests a particular way in which the load manipulation affected the impact of envy on willingness to pay. Cognitive load moderated the effect of the neighbor conditions on envy, but did not moderate the effect of envy on the willingness to pay for the superior food of the neighbor. In other words, envy was stronger under high than under low cognitive load. Higher envy was then

related to a higher willingness to pay for the envied good. This relation was not affected by the load manipulation.

In participants' taste judgments of the inferior biscuits, there was a marginal effect towards a higher evaluation reported by those participants who faced a better-off other as compared with those who faced an equally endowed other. This result is in line with a "sweet lemons" rationalization strategy in response to being deprived of a desired good, in which the evaluation of the inferior good is raised. This effect was not moderated by the load manipulation. This could be due to the fact that the taste judgments were performed after the cognitive load manipulation was lifted (which was done intentionally to keep the cognitive load phase of the experiment as short as possible). However, the difference in evaluation between the neighbor conditions may have also been caused by a contrast effect within the equal neighbor condition, whose participants tasted both the desirable ice cream and the less desirable biscuits.

In sum, the results of Experiment 2 lend credence to the interpretation that taxed mental resources influenced participants' judgment by impairing their capability to control and alter their emotional reaction. However, for the main findings, two alternative interpretations remain. First, it also seems possible that the cognitive load manipulation merely affected the expression of envy. For example, participants in the high load condition might have lacked the resources to assess the normativity of their answer on the envy item and thus not refrained from admitting their envy. Second, one could assume that the expression of envy itself caused the higher willingness to pay for the superior product. Participants might have inferred their valuation of the superior product from their answer to the envy item (Bem, 1972). Given that all participants



were asked to report how strongly they envied their neighbor prior to indicating their willingness to pay, this interpretation cannot be ruled out on the basis of Experiment 2's data. Another limitation of Experiment 2 is that participants' inclination to acquire the superior good was solely assessed hypothetically.

The following experiments address these issues by measuring spontaneous purchasing behavior (Exp. 3) and employing an implicit measure of participants' impulsive approach behavior towards the superior good (Exp. 4) without preceding envy measures.

## Experiment 3

Participants of Experiment 2 expressed more envy and a higher proclivity to acquire the superior food that was not assigned to them but to their experimental partner when experiencing high cognitive load. To provide direct evidence for the effects of envy on the likelihood to purchase the envied good, Experiment 3 tested whether an envy provoking situation would affect actual, spontaneous buying behavior.

Following up on the previous study, in Experiment 3, all participants were put under high cognitive load. Again, in the crucial experimental condition, participants experienced a better-off neighbor. In this Experiment, this condition was compared to a no-neighbor condition (as in Experiment 1). Participants in the better-off neighbor condition were assigned to taste an undesirable sauerkraut juice, while their neighbor (a confederate) was assigned to taste a more desirable fruit smoothie. Participants in the no-neighbor condition were also assigned to taste the sauerkraut juice (and were

deprived of the smoothie) but were alone. After the assignment procedure, all participants were given the opportunity to purchase the superior food.

I expected that those participants who were assigned to the inferior product in the presence of a better-off other would be more likely to spontaneously purchase the superior product than those who participated alone.

## ***Method***

### *Participants and Design*

Participants were 53 adults (46 female, 7 male; age 19 to 34) who had been recruited at a campus of the University of Cologne. All of them were given the high cognitive load task (see Experiment 2). About half of them were assigned to a better-off neighbor condition; the other half was assigned to a no-neighbor condition. They participated in exchange for a 10% chance to win 10 Euro in a lottery.

### *Procedure*

Experimental set up and initial procedure were identical to Experiment 2. However, a different pair of foods was presented. The less desirable food was a carton of sauerkraut juice (*Alnatura Sauerkrautsaft*, a fermented cabbage juice), the more desirable food was a bottle of brand fruit smoothie (*True Fruits Smoothie*, see footnote 6, p. 31). After forming an impression of the foods, participants proceeded with the cognitive load task as in Experiment 2. However in this experiment, all participants were asked to remember the difficult 8-digit number (i.e., high cognitive load condition). Then, the food was assigned with the same explanation and the same slot-

machine-like animation as in Experiment 2, but implementing the experimental conditions of Experiment 1. In the better-off neighbor condition, the computer ostensibly assigned the sauerkraut juice to the participant and assigned the smoothie to a confederate – who pretended to be another participant. In the no-neighbor condition, the computer also ostensibly assigned the sauerkraut juice (and not the smoothie) to the participant, but no other participant was present. In this condition, the research assistant who acted as a confederate in the other condition was in the room too, but revealed being part of the research team by telling the experimenter that he or she was using the computer to enter data.

After the computer had assigned the food, the participant was led to a second experimenter in another room to complete the taste test (in the condition with the confederate, he or she was led to a third room). This was done to ensure that the second experimenter was blind to the condition of the participant. After having introduced him- or herself, the experimenter remarked that too many smoothies had been bought accidentally and offered the participant to purchase a smoothie “at cost price for 1.30 Euro instead of 2.30 Euro” (for a similar procedure see Xu & Wyer, 2008, Exp. 4). Then, the participant wrote down the 8-digit number and proceeded with the taste test. During the taste test, they indicated on 9-point scales, how good the juice tasted (1 = very bad, 9 = very good) and to what extent the juice was delicious, aromatic, and refreshing (1 = not at all, 9 = very much). The four items were internally consistent, Cronbach’s  $\alpha = .74$ , and thus averaged to a taste evaluation score. At the end, every participant was given a 10% chance to win 10 Euro in a lottery.

## **Results**

I predicted that participants (whose mental resources were taxed) would be more likely to spontaneously purchase a superior food if they were aware of a neighbor who was better off because he was assigned to taste the superior food. The results are indeed consistent with this prediction. Given the opportunity, 12 out of 25 participants (48.0 %) with a better-off neighbor bought the smoothie. In contrast, only 6 out of 28 participants (21.4 %) who participated alone bought the smoothie. The frequency difference between the conditions was significant,  $\chi^2(1, N = 53) = 4.16, p = .04$ .

Interestingly, participants in the better-off neighbor condition judged the sauerkraut juice to taste better ( $M = 4.25, SD = 1.99$ ) than participants who did not face a better-off other during the assignment procedure ( $M = 3.21, SD = 1.44$ ),  $t(51) = 2.20, p = .03$ .

## **Discussion**

The results of Experiment 3 replicate the findings of Experiment 2 by showing that cognitively taxed participants were more inclined to buy an attractive food they were deprived of if a neighbor had been endowed with this superior good. Furthermore, the results of Experiment 2 were extended by demonstrating that the envy provoking situation affected actual purchasing behavior. Given that participants could purchase the smoothie directly after the assignment procedure, without in-between self-report about their envy, the findings corroborate the hypothesis that uncontrolled envy entails an

impulse to strive for the envied good, regardless whether people are pointed to their envy or not.

Another result of Experiment 3 is that participants evaluated the taste of the sauerkraut juice more positively when having been assigned to taste it in the presence of a better-off other than when participating alone. This finding supports the notion that a way to cope with the negative emotional consequences of an envy-evoking situation is to rationalize one's outcome by increasing its value, resulting in a "sweet lemon" effect. Participants may have done so because during the taste test the cognitive load instruction was already lifted. Participants in the no-neighbors condition were also deprived of the superior smoothie and they might have rationalized their outcome too. However, since their emotional experience can be assumed to have been less intense, they should be less motivated to exert emotional self-control.

An advantage of this experiment is that participants' proclivity to buy the superior good was assessed in a more subtle way: The opportunity to purchase the smoothie was seemingly unrelated to the purpose of the "taste study", and thus not readily apparent as measure used by the experimenters. However, this experiment did not include a condition without cognitive load. Hence, the question remains whether the null effect found for better-off neighbor/low load participants in Experiment 2 was due to the fact that their inclination to obtain the superior good was measured blatantly by the self-report willingness to pay item. As discussed before, this item might have been susceptible to social desirability concerns. Thus, participants in Experiment 2's better-off neighbor/low load condition might have felt the same desire for the superior product

but might have refrained from expressing their desire. Experiment 4 addresses this issue by using an implicit measure of the participant's approach tendency.

## Experiment 4

The results of Experiments 2 and 3 demonstrate that envy heightens participants' desire for the superior good of their neighbor by showing an increased inclination to acquire this good under conditions of taxed capacity to exert self-control. Extending these findings, Experiment 4 sought to trace the impulsive behavioral consequences of envious longing.

To this end, I used an implicit measure (for a recent review, see Petty, Fazio, & Briñol, 2008) of participants' automatic tendency to approach vs. avoid the envied good. The experimental paradigm was similar to the one used by Chen and Bargh (1999; see also Seibt, Häfner, & Deutsch, 2007). Participants had to respond as quickly as possible to pictorial stimuli by pushing or pulling a joystick. As the task was framed in a way that pulling the joystick towards oneself was associated with an approach movement and pushing the joystick away was associated with an avoidance movement, participants' behavioral approach tendency towards the stimuli can be inferred from their reaction times (Seibt, Neumann, Nussinson, & Strack, 2008; see also Eder & Rothermund, 2008; Markman & Brendl, 2005). Approach-avoidance measures like the one used in this study can be assumed to reflect the impulsive behavioral readiness to approach stimuli, triggered by immediate evaluations upon their encounter (Strack & Deutsch, 2004). Previous research has shown that measurement procedures based on approach and avoidance movements are sensitive to interindividual motivational

differences, such as variation in sexual desire (Hofmann, Friese, & Gschwendner, 2009), and to differences in need states, such as the desire for food evoked by hunger (Seibt et al., 2007), or the attraction to erotic stimuli caused by sexual abstinence (Seibt, Häfner, Strack, & Deutsch, 2008).

Participants were assigned to high and low load conditions. As in Experiment 3, participants were deprived of a more attractive food either in the presence or without the presence of a better-off neighbor. Subsequently, participants completed the approach-avoidance task, in which they responded to pictures of the superior food, the inferior food, and neutral objects by pushing or pulling a joystick. Given that participants' task, namely to classify the pictures according to their position of the screen, was unrelated to the stimuli, and because they had to respond as quickly as possible within a narrow time window, reaction times can be assumed to reflect automatic behavioral inclinations, which are unlikely to be affected by concerns about the social desirability of the responses (Petty et al., 2008).

I predicted that under high load, the envy evoking situation results in an impulsive approach tendency towards the superior food. Under low load this should not occur, given that participants in this condition have the cognitive capacity to control their emotional response at their disposal.

## ***Method***

### *Participants and Design*

Participants were 96 (53 female, 43 male; age 18 to 59) visitors of the main cafeteria of the University of Cologne. They were assigned to a 2 (neighbor: better-off

vs. none)  $\times$  2 (cognitive load: high vs. low)  $\times$  3 (stimulus: superior food vs. inferior food vs. neutral)  $\times$  2 (response: approach vs. avoidance) mixed-factorial design<sup>8</sup>, with the first two factors manipulated between participants and the latter two factors manipulated within participants. Participants received 4 Euro as compensation.

### *Procedure*

After the initial instructions, which were identical to Experiments 2 and 3, participants were introduced to the approach-avoidance task, which was referred to as “a reaction time task.” They were told that they would first complete a practice block of the task, proceed with other tasks, and then complete the reaction time task again.

Participants were instructed to push or to pull the lever of a joystick in response to pictorial stimuli presented on a computer screen (the procedure was similar to the one used by Seibt, Häfner, & Deutsch, 2007, Exp. 3). The required response (pushing vs. pulling) depended on the vertical position in which the stimuli appeared. For example, when a stimulus appeared on the upper half of the screen, participants had to pull the lever of the joystick. In contrast, when a stimulus appeared on the lower half of the screen, participants had to push the lever of the joystick. The assignment of push vs. pull movements to stimuli appearing on the upper vs. the lower half of the screen was counterbalanced across participants. To enhance the association of pulling the joystick

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<sup>8</sup> Additionally, it was counterbalanced between participants whether stimuli appearing on the top (or bottom) of the screen had to be responded to with an approach (or avoidance) movement. As this methodological factor did not alter the predicted neighbor  $\times$  load  $\times$  stimulus interaction,  $F(2, 176) = 1.05$ ,  $p = .35$ , further analyses are collapsed over both combinations.



with an approach movement and of pushing the joystick with an avoidance movement, participants were asked to “pull the appearing objects towards you” and “push the appearing objects away from you” using the joystick (Seibt et al., 2008). Furthermore, following participants’ response, a decrease in distance for pulled objects and an increase in distance for pushed objects were simulated by gradually increasing or decreasing the size of the stimuli by 44% in an animation that lasted 270 ms (for a similar procedure see Wentura, Rothermund, & Bak, 2000, Exp. 3). Both speed and accuracy of responses were emphasized. To prompt spontaneous reactions, a response window of 300 ms to 1,300 ms was employed. In case, participants underran the response window, they were reminded to wait for the stimulus. In case participants overran the response window, they were reminded to respond faster. If participants moved the joystick in the wrong direction, they received an error message. Interstimulus interval (with blank screen) was 2,500 ms.

In the practice block, participants responded to 8 neutral pictures (see Appendix). Each stimulus was presented twice on the upper half of the screen and twice on the lower half of the screen, totaling 32 randomly ordered trials.

After the practice block, the two foods were shown to the participants. As in Experiment 3, the foods were a fruit smoothie (*True Fruits* smoothie) and sauerkraut juice (*Alnatura Sauerkrautsaft*, see footnote 6, p. 31).

Then, participants received the cognitive load manipulation, which was identical to the one used in Experiment 2. Participants in the high load condition had to remember a difficult 8-digit number, whereas participants in the low load condition had to remember an easy 8-digit number.

Next, the foods were assigned using the same procedure as in Experiment 3. Participants in the better-off neighbor condition were assigned to the sauerkraut juice, while their experimental partner (a confederate) was assigned to the smoothie. Participants in the no-neighbor condition were assigned to the sauerkraut juice (and not the smoothie), without an experimental partner being present.

Then, participants completed the four target blocks of the approach vs. avoidance task. Within each block, a picture of the sauerkraut juice and a picture of the smoothie were presented twice on the upper half and twice on the lower half of the screen. Additionally, pictures of four neutral objects (see Appendix) were presented once on the upper and once on the lower half of the screen, totaling 16 randomly ordered trials per block.

Before tasting the sauerkraut juice, participants wrote down the 8-digit number. Taste judgments were provided on the same items as in Experiment 3, which were averaged into a taste evaluation score (Cronbach's  $\alpha = .72$ ). Finally, participants were thanked and paid.

## ***Results***

The analysis is based on the four target blocks of the approach-avoidance task. All error trials were discarded (2.0 % of the data), along with all reaction times outside of the response window of 300 ms to 1,300 ms (3.1 % of the data). Mean response latencies were computed separately for approach and avoidance trials within each stimulus category. For ease of presentation, the mean reaction time for approach trials was then subtracted from the mean reaction time of avoidance trials for each stimulus

category. The resulting difference scores reflect the approach tendency toward the stimuli. The faster participants were in approaching the stimuli compared to avoiding the stimuli, the higher the score.

I expected that under high cognitive load, participants with a better-off neighbor display stronger approach tendencies towards the superior food than those without a better-off neighbor. In contrast, under low cognitive load, this should not occur.

As revealed by the means depicted in Figure 4, the data supports these predictions. Descriptively, in the high load condition, the highest approach tendency towards the superior food was shown by participants with a better-off neighbor ( $M = 48.03$  ms,  $SD = 39.50$ ) in contrast to the lower approach values towards the inferior food ( $M = 2.08$  ms,  $SD = 100.23$ ) and neutral stimuli ( $M = 11.24$  ms,  $SD = 40.42$ ) in this condition. Conversely, the means did not differ much in the high load/no-neighbor condition ( $M_{superior} = 12.39$  ms,  $SD = 59.14$ ;  $M_{inferior} = 10.84$  ms,  $SD = 101.06$ ;  $M_{neutral} = 28.98$  ms,  $SD = 57.83$ ). As opposed to the pattern of means in the better-off neighbor/high load condition, participants in the low load condition who had a better-off neighbor approached the superior food ( $M = 12.73$  ms,  $SD = 67.89$ ) less than the inferior food ( $M = 36.44$  ms,  $SD = 63.78$ ) and neutral stimuli ( $M = 35.86$  ms,  $SD = 40.24$ ). Again, this difference was not present in the low load/no-neighbor condition ( $M_{superior} = 48.78$  ms,  $SD = 93.46$ ;  $M_{inferior} = 41.32$  ms,  $SD = 73.37$ ;  $M_{neutral} = 39.11$  ms,  $SD = 57.36$ ).

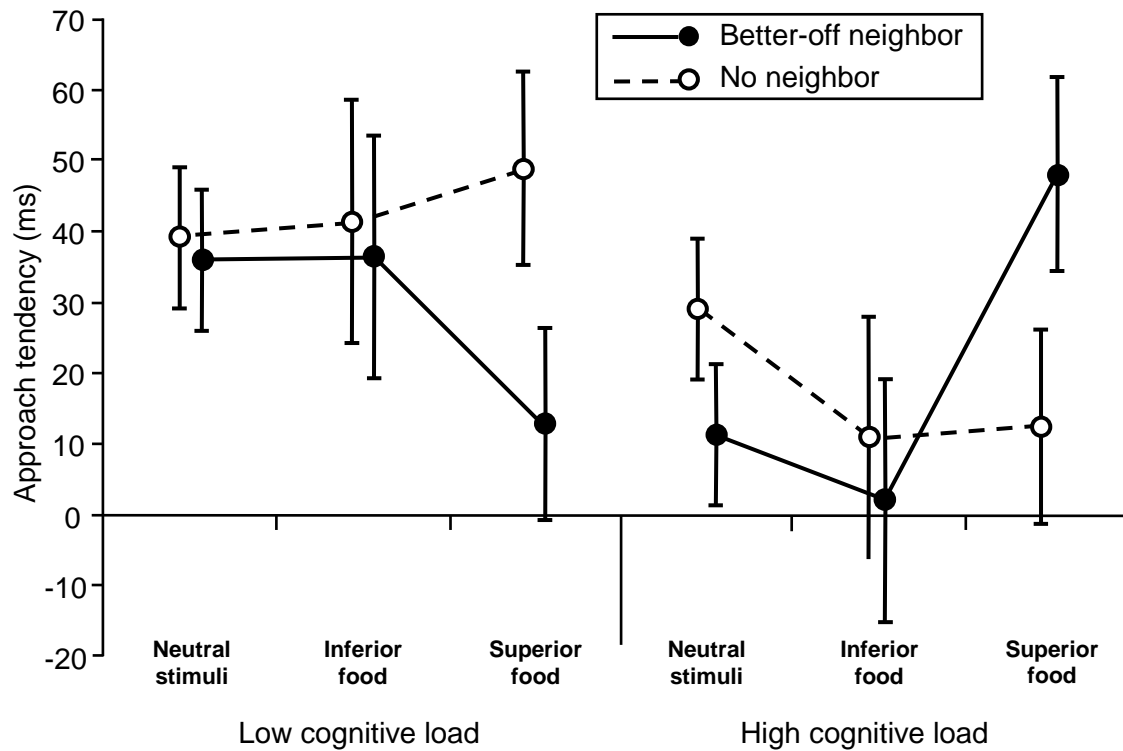


Figure 4. Mean approach tendency in ms (reaction time of approach movements subtracted from reaction time of avoidance movements) towards the inferior food, towards the superior food, and towards neutral objects as a function of neighbor condition and cognitive load (Experiment 4). Error bars represent one standard error ( $n = 23$  to  $25$  per between subjects condition).

The mean approach tendency scores were submitted to a 2 (neighbor: better-off vs. none)  $\times$  2 (cognitive load: high vs. low)  $\times$  3 (stimulus: smoothie vs. sauerkraut juice vs. neutral) repeated measures ANOVA. The analysis revealed a significant three-way interaction,  $F(1.90, 170.68) = 7.11, p = .03$ , which qualified a marginal load main effect,  $F(1, 92) = 2.89, p = .09$  due to the overall higher approach tendency in the low load condition ( $M = 35.71, SD = 49.31$ ) than in the high load condition ( $M = 18.93, SD = 46.77$ ). No other main effects or lower order interactions were significant,  $F_s < 1.63, p_s > .20$ .

To further analyze the data, planned contrasts were computed within the experimental conditions. High load/better-off neighbor participants approached the superior food more than the other stimuli,  $F(1, 22) = 7.48, p = .01$ . Conversely, low load/better-off neighbor participants tended to approach the superior food less than the other stimuli,  $F(1, 24) = 3.03, p = .09$ . Neither of the effects emerged when participants were alone ( $F_s < 1$ ). Analyzing only the responses towards the superior food, high load participants approached it more when next to a better-off neighbor than when being alone,  $F(1, 92) = 3.12, p = .08$ . Under low load, the opposite occurred  $F(1, 92) = 3.46, p = .07$ .

Participants' taste judgments about the sauerkraut juice were also affected by the experimental manipulations. Particularly, in the high load condition, participants facing a better-off neighbor liked the taste of the sauerkraut juice descriptively less ( $M = 3.52, SD = 2.05$ ) when facing a better-off other than when being alone ( $M = 4.21, SD = 1.23$ ). In contrast, in the low load condition, participants facing a better-off neighbor liked the taste of the sauerkraut juice descriptively more ( $M = 4.61, SD = 1.65$ ) when facing a better-off other than when being alone ( $M = 3.95, SD = 1.89$ ). This pattern resulted in a marginally significant interaction effect in a 2 (neighbor: better-off vs. none)  $\times$  2 (cognitive load: high vs. low) ANOVA,  $F(1, 92) = 3.58, p = .06$ . No other effects emerged,  $F_s < 1.37, p_s > .25$ . The single contrast comparing the neighbor conditions within the high load condition was not significant,  $F(1, 92) = 1.78, p = .19$ , neither was the single contrast within the low load conditions,  $F(1, 92) = 1.90, p = .18$ .

### *Discussion*

The goal of Experiment 4 was to show that when participants' capacity to exert self control is constrained, an envy provoking situation results in an impulsive behavioral tendency to approach the envied good. In line with this prediction, participants in the high load condition had a stronger automatic approach tendency towards the superior food they had been deprived off, only when sitting next to a better-off neighbor. In contrast, this effect did not occur when they were alone.

Interestingly, in the low load condition, participants tended to approach the superior food less when a better-off neighbor was present, in line with the view that "sour grapes" can result from an envy-evoking situation. For participants in this condition, coping with their envy may have led to a negative evaluation of the superior food, resulting in less automatic approach behavior.

Some readers might be surprised by these findings, especially because implicit attitudes are sometimes considered to be relatively stable and difficult to change (e.g., Gregg, Seibt, & Banaji, 2006; Wilson, Lindsey, & Schooler, 2000). However, there is evidence supporting the notion that impulsive responding can be flexible. Such effects have been predominantly demonstrated in the domain of stereotyping and prejudice (Blair, 2002). For example, situational motivations of individuals can alter the automatic operation of stereotypes and prejudice (Sinclair & Kunda, 1999; Spencer, Fein, Wolfe, Fong, & Duinn, 1998). Also, reflective processes can alter the accessibility of contents within the impulsive system (Strack, Werth, & Deutsch, 2006; see also Gawronski & Bodenhausen, 2006). For example, counterstereotypic mental imagery attenuated automatic stereotyping in a study by Blair, Ma, and Lenton (2001). Similarly, focusing

on information unrelated to a stereotype can reduce automatic stereotypic responding (Macrae, Bodenhausen, Milne, & Ford, 1997). Thus, the impulsive orientation towards a stimulus may be influenced by how the stimulus is construed in a given situation and can thus be susceptible to emotional reappraisal strategies.

Unexpectedly, there was a tendency to approach all stimuli more in the low load condition than in the high load condition. One might speculate that the difficult dual task completion was a somewhat aversive experience for participants in the high load condition, which might have led to a decreased approach focus in general. However, given that I predicted differential effects within the load conditions, this result is extraneous to the hypotheses.

Participants' evaluations of the taste of sauerkraut juice, the inferior food they were assigned to, seemed to be in line with a "sweet lemons" rationalization strategy only, when they were not taxed by cognitive load. In this condition, participants judged the sauerkraut juice to taste better when facing a better-off neighbor than when being alone, as compared to the high load condition in which the opposite pattern emerged. However, it has to be noted that the statistical support for this effect is weak. Nevertheless, these tentative results are at odds with the findings from Experiment 2, in which participants taste judgments were not affected by the load manipulation. The results are also inconsistent with Experiment 3, in which there was a "sweet lemons" effect for better-off neighbor participants despite the high cognitive load they were subjected to. Procedural differences may be responsible for this discrepancy. While the taste judgments of all three experiments were carried out after the load manipulation was lifted, its duration and the concurrent tasks differed. While the load manipulation in

Experiments 2 and 3 had to be followed for a short time only and was accompanied by relatively easy tasks, in Experiment 4, the load task had to be followed carried in parallel to the longer and more demanding approach-avoidance task. In combination, the two tasks may have depleted self-regulatory resources (Baumeister et al., 1998) that would have been needed to cognitively “sweeten the lemon” during the subsequent taste test.



## General Discussion

In the present thesis, I explore the preconditions and the consequences of envious desire – an experience that appears to be a universal outcome of the human condition and to convey vast interpersonal, societal, and economic implications (Aristotle, trans. 1929; Belk, 2008; Foster, 1972; De la Mora, 1987; Douglas & Isherwood, 1979; Frank, 2000; Girard, 1979, 2001; Schoeck, 1971). Based on social comparison research (Festinger, 1954; Gilbert et al., 1995; Suls & Wheeler, 2000;), evolutionary psychology (Hill & Buss, 2006, 2008), a dual process perspective on psychological functioning (e.g., Strack & Deutsch, 2004), and research on self-control (Baumeister & Vohs, 2004; Gross, 2006), I argue that when becoming aware of someone possessing a superior good, spontaneous social comparisons automatically evoke envious discontent and an impulsive striving for this good. However, given that expressing envy violates social norms, and because experiencing envy is both painful and detrimental to the positive self-views that people try to maintain, people should be motivated to control their emotional reaction. Thus, the consequences of an envy-evoking situation should be evident only when people's capacity to exert self-control is taxed.

In four experiments, envy was elicited by depriving participants of a somewhat more desirable food, while facing another participant (or confederate) who was asked to taste this food. Experiment 1 provided support for the hypothesis that envious discontent is particularly strong among participants with constrained self-control. The greater participants' alcohol intoxication, the more dissatisfied, angry, and envious they

were in response to not receiving the chocolate, which was superior to their simple candy. As predicted, this happened only when they were in the presence of a better-off other, but not when they were alone. Participants of Experiment 2, who received butter biscuits and not the more desirable ice cream sundae, were more envious towards their better-off neighbor and willing to pay more for the superior good, only, if their cognitive capacity was taxed by high cognitive load. Additionally, experienced envy mediated the effect of the envy-evoking situation on participants' willingness to pay for the more desirable good. Under identical conditions, Experiment 3's participants, who were asked to taste sauerkraut juice and not the more desirable fruit smoothie of their neighbor, were more inclined to spontaneously purchase the superior drink than participants who were deprived of the smoothie, too, but did not face a better-off other. Finally, Experiment 4 provided evidence for the impulsive behavioral approach tendency that is elicited in this situation. Participants who were taxed by high cognitive load while facing a better-off neighbor were faster in approaching the superior stimulus in a reaction time-based approach-avoidance measure than those, who participated alone. Taken together, these studies provide converging evidence for the notion that spontaneous social comparisons result in envious discontent and impulsive longing for the superior good of another person if the capacity to control envy is taxed.

The studies also present some initial evidence on how people cope with envy given that they have the self-regulatory resources to do so at their disposal. A common coping strategy might be to cognitively change the meaning of the envy-evoking stimulus in order to decrease its perceived evaluation, resulting in "sour grapes". Participants in Experiment 4 seemed to have resorted to this strategy, as indicated by

their tendency to approach the superior good less, when being in an envy situation without additional cognitive load. Participants in some conditions of Experiments 2, 3, and 4 also showed signs of the complementary cognitive change strategy “sweet lemons”. When tasting their inferior food, they seemed to have raised their evaluation of it. The fact that these effects were less powerful and less robust across experiments, might reflect that people may use other coping strategies to deal with envy-evoking situations. Further research is needed to elaborate these ways to regulate envy in more detail.

## Alternative Explanations

### *Social Facilitation*

Social facilitation might be perceived to be a potential alternative explanation for at least some of the present effects. In his seminal review, Zajonc (1965) observed that the presence of other people can increase arousal and causes an increase in the likelihood of dominant responses as evidenced by performance in simple as compared to complex tasks (Zajonc & Sales, 1966). Several additional mediating mechanisms have been proposed. An example is the notion that the mere presence of others is distracting and can cause cognitive overload (e.g., R. S. Baron, 1986), resulting in a narrowed attentional focus (Huguet, Galvaing, Monteil, & Dumas, 1999). The consequences include a greater focus on food and increased food intake (Hetherington, Anderson, Norton, & Newson, 2006).

As both the frustration about being deprived of a desired good as well as the tendency to approach this good can easily be conceived as a dominant response, the mere presence of another person might increase their likelihood. This is particularly relevant for Experiments 1 and 4 in which participants were either alone (no-neighbor condition) or in the presence of a confederate (better-off neighbor condition). However, Experiments 2 and 3 speak against such an interpretation. Here, participants in the control conditions were not alone. While in Experiment 2, participants in the control conditions were not deprived of the superior good, Experiment 3's control condition is directly comparable to those of Experiment 1 and 4 in that respect. However, Experiment 3 can rule out a social facilitation account because the number of people in the room was constant across conditions. When the inferior food was assigned to the participant, the confederate was always present. The difference being that in the no-neighbor condition, he or she posed as a research assistant. With regard to Experiment 4, it is also conceivable that the close presence of another person in the better-off neighbor condition increased the likelihood of the presumably dominant approach response toward the desired smoothie. This might be especially likely in the high cognitive load condition, in which the distraction caused by the load manipulation and the other person is combined. However, from a social facilitation perspective, one would not have predicted the flip of the pattern in the low cognitive load condition. Thus, in sum, social facilitation effects cannot explain the set of findings throughout the four experiments.

### *Scarcity*

At first glance, it might also seem that there is much overlap of the present findings with research on the effects of scarcity on evaluations. Participants in the critical conditions of the presented experiments were deprived of the opportunity to taste a superior food. According to commodity theory (Brock, 1968), “any commodity will be valued to the extent that it is unavailable” (p. 246). That scarcity enhances the perceived value of products and opportunities is largely supported by empirical data (for a meta-analysis see Lynn, 1991). For example, Worchel, Lee, and Adewole (1975), asked participants to rate the attractiveness of cookies in abundant or in scarce supply. Cookies in scarce supply were perceived to be more attractive (especially when they had been in abundant supply before). Extending these findings, Ditto and Jemmot (1989) showed that scarcity information makes negative evaluations more extreme, too. Thus, generally, the knowledge that a commodity is scarce can lead to evaluative polarization.

It is reasonable to assume that by making the superior foods unavailable to participants, in the present studies, perceptions of scarcity were induced. Even so, more discontent and increased desire was evident only in the experimental conditions in which another person received the food that was unavailable. In the no-neighbor conditions of Experiments 1, 3, and 4, care was taken to ensure that participants perceived the likelihood to attain the superior food to be equally high as participants with a better-off neighbor. Furthermore, they experienced the same vivid assignment procedure. And eventually, they were deprived of the superior food, too. However – in contrast to the better-off neighbor condition – they participated alone and were thus not

in the immediate presence of another person asked to taste the superior food. Thus, the objective scarcity was identical in both experimental conditions.

Nonetheless, one might argue that the presence of a better-off other made the unavailable option even more salient and as a result may have contributed to the perceived scarcity of this superior alternative. As I did not measure subjective scarcity estimations, I cannot rule out this alternative explanation based on data. Still, I think it is unlikely that scarcity drove the effects. The key question is why scarcity should affect the desire to attain the superior good primarily when mental capacity is taxed, as found in the present research.

Speculating about the psychological mechanism that causes scarcity effects, several researchers have argued that scarcity serves as a heuristic cue (Ditto & Jemmott, 1989; Cialdini, 1987, 1993). According to this view, information about the prevalence of a given commodity is used as a rule of thumb ("rare things are extreme things") to determine its value. Thus, in the case of positive commodities, scarcity should automatically lead to increased attractiveness judgments. A straightforward implication would be that people whose cognitive capacity is constrained by situational demands will react more strongly to scarcity information because they should be more prone to resort to heuristic strategies.

However, opposing the heuristic account of scarcity effects, Brock and Brannon (1992) posited that evaluative polarization is mediated by elaborative processing rather than by automatic inferences. According to them, scarcity enhances the scrutiny devoted to evaluating a commodity and thus leads to more extreme judgments. A convincing body of research supports this assertion (Bozzolo & Brock, 1992; Brannon & Brock,

2001a, 2001b; Brock & Mazzocco, 2004). For example, using path analysis, Brannon and Brock (2001b, Exp. 1) showed that attitudinal effects of scarcity information were mediated by thoughtful processing. Furthermore and most relevant to the interpretation of the present studies, scarcity effects were present under low cognitive load, but were eliminated in a high cognitive load condition similar to the one used in the present research (Brannon & Brock, 2001b, Exp. 2).

Thus, the present findings are unlikely due to scarcity estimations. Even though the experimental procedures may have induced the perception that the superior products are scarce commodities, from the scarcity literature one would predict a different pattern of results. Because evaluative scarcity effects are mediated by effortful processing, the desire for the unattainable food should have been most intense under low cognitive load. On the contrary, in the present studies the desire for these products was greatest under high cognitive load, supporting the view that (uncontrolled) impulsive striving elicited by an envious reaction produced the reported findings.

### ***Reactance***

Other related findings stem from research on reactance theory (Brehm, 1966; Brehm, Stires, Sensenig, & Shaban, 1966;), which deals with unavailable options as well, but focuses on the motivational consequences of restricted freedom. According to this theoretical perspective, restricting the freedom to engage in a particular behavior results in reactance – a “motivational state directed toward restoration of the eliminated or threatened freedom” (Brehm et al., 1966, p. 306). If, for example, the freedom to choose a specific object is taken away, the desire to attain this object should be

amplified. In a classic experiment supporting this hypothesis, Brehm and colleagues (1966) asked participants to rate their preference of four attractive records in order to freely choose one of them. Later, one of the promised choice alternatives was eliminated without a reasonable justification. As predicted by reactance theory, participants rated the eliminated choice alternative to be more attractive than in their initial preference assessments.

The experimental procedures used in the present studies have several commonalities with the ones employed by Brehm et al. (1966). Specifically, participants were presented with two differently attractive foods, and they were deprived of one of them. However, reactance theory does not predict that the amplification of attractiveness should depend on the presence of a better-off other as found in the present studies. Again, one might argue that the presence of the better-off other made the unattainable alternative more salient to participants. However, the present findings are unlikely to be commensurate with the ones of Brehm et al. (1966) because of a crucial difference. In the present studies, the experimental instructions made it very clear from the beginning to participants that they would not have the freedom to choose the foods. Instead, they assumed that they would be randomly assigned to one of them. In fact, this corresponds to the procedure of a control condition used by Brehm et al. (1966, Exp. 2). In this condition, participants were also led to believe that they would receive a record. However this time, rather than being allowed to freely choose one of them, the record they would receive was to be determined by chance. When one of the records was eliminated from the set of four promised alternatives, its attractiveness did not increase. In contrast to the free choice condition, actually, some signs of decreased attractiveness



for the eliminated alternative were present in the random assignment condition (a “sour grapes” effect). Hence, it is not a plausible interpretation that the pattern of results in the present studies was due to reactance, or that the employed procedures produced a state of reactance at all.

## Relation to Previous Research

### *Research on Envy*

The present line of research contributes in several ways to the literature on envy. First of all, it demonstrates that it is possible and worthwhile to instigate envious reactions about goods experimentally. The present results were obtained using a variety of envy-evoking objects both in the field as well as in a more controlled laboratory environment, and show consistent effects on self-report and behavioral measures. Thus, the employed experimental paradigm offers a way to empirically investigate the complexities of envy, how an envious episode unfolds in time, and what cognitive, affective, and behavioral consequences it bears.

Secondly, the present research confirms the importance of a component of envy that is widely acknowledged in envy theory, but has received little empirical attention – the intensified desire for the superior good of another person. While intense longing has been shown to be the most characteristic trait of envy in experiential studies (Bers & Rodin, 1984; Parrott & Smith, 1993; R. H. Smith et al., 1988), the data reported here demonstrate experimentally that becoming aware of an advantaged other can cause

desire. I contend that the intensified and frustrated desire for another person's superior good or quality is at the core of experiencing envy and that it is driving the outcome of an envy-evoking situation. The present line of investigation may help to shift the focus of envy research from descriptive analyses to research that explores the cognitive processes in envious responding.

Thirdly, in another contribution to this endeavor, this research is the first to demonstrate empirically that the exertion of self-control is crucial to understand envy – a notion that is implicit in many accounts of envy (e.g., Elster, 1999; Farber, 1966; Kant, 1797; R. H. Smith & Kim, 2007; Parrot, 2001). Applying a dual-process view of human thinking to the investigation of envious responding, the current evidence reveals that invidious discontent and desire are subject to self-regulatory processes, which alter the outcome of an envy-provoking situation. This offers an explanation why it has often been difficult to trace envy – the elusive “secret vice” (J. Epstein, 2003, p. 17) – empirically (Farber, 1966). Envy can thus be portrayed as an impulsive reaction, that is particular likely to affect behavior when resources to exert self-control are lacking. Consequences of attempts to control an envious emotional episode may account for a multitude of – often conflicting – notions about the elements and effects of envy. For example, as outlined in more detail in the introduction, a dual process view can explain why and when envy may lead to the disparagement of the superior good or quality of another person and not to intensified desire. Furthermore, it offers another hint of when envy may be transformed into other emotions such as admiration or resentment, only then when people have the capacity to change their emotional responding.

*Impulse and Self-Control in Consumer Behavior*

Closely related to this thesis is research trying to unravel the impulsive determinants of consumer behavior (for an overview, see Faber & Vohs, 2004). Several recent theoretical approaches stress that consumers find themselves often in situations in which they are tempted by impulsive urges to consume, and that in consequence, they are put in a conflict between their desires and rational considerations (Baumeister, Sparks, Stillman, & Vohs, 2008; Hoch & Loewenstein, 1991; Strack et al., 2006).

Most notable in the present context are experimental studies that have explored the relationship of self-control capacity and impulsive consumption. A number of studies have shown that if reflective processes are impaired, consumption behavior is determined by impulsive processes. For example, Shiv and Fedorikhin (1999) studied the importance of affective product qualities in predicting choices under high cognitive load. Participants were given a choice between two products: an affectively positive but unhealthy chocolate cake or a comparatively less attractive but healthier fruit salad. When participants' cognitive capacity was taxed by having them memorize a 7-digit number, their decision was driven by their impulsive desire and they preferred the chocolate cake over the fruit salad (see also Gibson, 2008). In related research, Hofmann and Friese (2008) assessed cognitive dietary restraint standards and implicit attitudes towards a specific candy and gave participants to taste the candy in an ostensible taste test. While for sober participants, the amount of consumed candy was mainly predicted by their restraint standard, for intoxicated participants, only the implicit attitudes toward the candy predicted consumption. Such a breakdown of self-control in terms of dietary standards has also been induced by cognitive load (Ward &

Mann, 2000) and ego-depletion manipulations (Vohs & Heatherton, 2000). Vohs and Faber (2007) looked at the role of self-control in impulsive spending. Across three experiments, the depletion of self-control resources through tasks that required attentional control, thought suppression, and emotional modulation led to a higher willingness to pay and actual overspending in subsequent buying situations.

These studies show that whether purchasing and consumption are determined by impulsive factors hinges on the capacity to exert self-control. The present findings contribute to and extend this line of research. While replicating that impulsive responding and purchasing is most likely when mental capacity is constrained, they identify the social context as an important source of the content and elicitation of impulses in a given situation. When under cognitive load, participants impulsively longed for the better good that their neighbor had.

## Future Directions

Several limitations to the current studies may provide the first useful avenues for future research. Admittedly, breadth and level of detail of the measures assessing participants' emotional experience in the current studies were limited. This restriction was intentional and is owed both to the procedural requirements of field experiments and the cognitive load manipulation, as well as to the sensitive nature of envy, which prompted me to leave participants – who believed to participate in a study on taste preferences – uninformed about the true nature of the experiments.

Nevertheless, I am confident that participants indeed experienced envy, and not related emotions such as admiration or resentment. Experiment 1's self-report measures show that participants' affective response to an advantaged other was clearly negative. They were unhappy and angry, which is inconsistent with an affectively positive emotion such as pure admiration. Furthermore, I put much effort in the experiments to ensure that the assignment procedure of the foods was (albeit only seemingly in some experiments) objectively fair – the foods were assigned randomly by the computer, and accordingly not due to any action or characteristic of the experimental partner or confederate. Hence, participants are unlikely to have felt righteous resentment (R. H. Smith & Kim, 2007). This also excludes the related construct of relative deprivation (e.g., Crosby, Muehrer, & Loewenstein, 1986; J. M. Olson & Hazlewood, 1986) as an explanation, which predicts negative emotional reactions in response to unequal outcomes produced by *unfair* procedures or events. Finally, participants themselves perceived the term “envy” as descriptive for their emotional state in Experiments 1 and 2, and the degree to which they did mediated the effect of the experimental manipulations on Experiment 2's indicator of desire for the superior product.

Notwithstanding, future research could elucidate the emotional response of participants in the present experimental paradigm in more detail. This would allow investigating whether the pattern of high load participants' emotional experience was similar to the non-malicious or malicious envy episodes described by some of Van de Ven et al.'s (2009) participants, and explore the conditions that lead to malicious ill will in envy. Furthermore, more fine-grained measures might clarify how participants in the low load condition experienced the situation emotionally. For example, they may have

transformed their emotional response in a more positive emotion, such as admiration. A way to circumvent the procedural limitations posed by using cognitive load manipulations simultaneously with the measures of interest might be to manipulate alcohol intoxication in the lab, or to use ego depletion manipulations (Baumeister et al., 1998) to manipulate self-regulatory resources.

More generally, it would be interesting to examine directly how people coped with the envy-evoking situation and the timing thereof. The present findings provide only incomplete information with regard to this question. Participants did not express discontent and envy when being sober or when assigned to the low cognitive load conditions. Furthermore, these participants did not show the behavioral consequences of increased desire. Rather, there was tentative evidence for decreased desire. For the reason that Experiment 4's results were obtained using an indirect (and thus difficult to control) measure of participants' approach tendency toward the envy-evoking good, it is unlikely that low load participants merely used the response-focused emotion regulation strategy of suppressing overt behavior. Instead, it seems more likely that they cognitively changed the meaning of the envy-evoking situation (for example the meaning of the envy stimulus or of their relation to the neighbor). But were they able to do so from the outset and prevented envy at all, or did they respond to their negative experience? Physiological measures of emotional arousal, such as skin conductance level, may provide a means to elucidate the course of envious responding and when and how people deal with it.

Future research should also investigate more precisely the cognitive consequences that are associated with perceiving a desired fortune in the hands of

another person and how they result in an increased desire towards this fortune. A useful framework may be provided by adopting the perspective of social cognitive work on automatic goal pursuit. A plethora of recent findings demonstrates that goals can be activated and pursued even in the absence of attentional capacity (Dijksterhuis, Chartrand, & Aarts, 2007). Perceiving someone who possesses something which we desire and thus aim to acquire ourselves might be seen as a situation that leads to the activation of this goal. Several findings on the elicitation and the cognitive mechanics of automatic goal pursuit match this notion. For example, perceiving goal related behavior of other persons can activate the goal in the perceiver (Aarts, Gollwitzer, & Hassin, 2004). Also, physical objects related to goals can activate their pursuit (Kay, Wheeler, Bargh, & Ross, 2004). Furthermore, the automatic evaluation of objects is sensitive to their relevance for goal attainment (Ferguson & Bargh, 2004).

Several new hypotheses may be derived from this perspective. For example, attentional processes might be an interesting point of departure. Recent evidence suggests that motivational states can adaptively tune the attentional system so that attention is involuntarily captured by motivationally relevant environmental stimuli (Fox, Russo, & Dutton, 2002; Maner, Gailliot, Rouby, & Miller, 2007; Moskowitz, 2002). In line with this notion, envy is often associated with the idea that attention is caught by the desired object (e.g., Parrott, 2001; see also Introduction and Theoretical Background section here). Part of this may also be reflected in the beliefs about the “evil eye” of an envier (Foster, 1972). Thus, becoming aware of another person possessing a desired object may result in “attentional adhesion” to this object, which

might be detected in experimental paradigms such as the dot probe visual cuing task (MacLeod, Mathews, & Tata, 1986).

Motivational processes have also been shown to affect basic perceptual processes. For example, fluid deprivation and the activated goal to drink have been shown to increase size estimations of a glass of water (Velkamp, Aarts, & Custers, 2008; see also, Bruner & Goodman, 1947). Relatedly, Balci et al. (2006) have demonstrated that people disambiguate and perceive ambiguous figures in terms of their active goals, providing evidence for a functional understanding of perception (Bruner & Goodman, 1947). Thus, another prediction that can be derived from a motivational perspective is that envy should affect the visual perception of an envy-evoking stimulus, leading to overestimations of its size (a mechanism that may have contributed to the higher willingness to pay in Experiment 2 of the present research) and an increased likelihood of detecting the envy object in ambiguous situations.

To analyze the cognitive underpinnings of envious desire more closely, one might also consider the distinction between wanting something and liking something. Here, I have implicitly equated the two notions. However, in their research on drug addiction, Robinson and Berridge (1993, 2001) argue that wanting and liking may in fact represent distinct elements of motivation, and that they are based on different neural structures. While liking refers to the hedonic qualities of a stimulus (e.g., the pleasurable or euphoric effects of a drug), wanting refers to the incentive salience of it and is more directly associated with approach-related behavior. While liking and wanting may often converge, they may also be separable in specific conditions (e.g., after repeated drug use, wanting may persist in the absence of liking). Based on the



arguments presented here, envy should be more strongly associated with an increase in wanting the envy-evoking object, and not necessarily with an increase in liking it. This idea could be tested by using an implicit evaluation measure alongside with an approach-avoidance task.

Finally, the research presented here might also profit from applying an individual differences perspective. People differ in several characteristics that are highly relevant for the presented theoretical framework. For example, some people are more prone to be envious than others in general (R. H. Smith, Parrott, Diener, Hoyle, & Kim, 1999). Furthermore, there is variation in the capacity to exert self-control (e.g., Tangney, Baumeister, & Boone, 2004), as well as in working memory capacity, which is related to the self-control of emotional expression and experience (e.g., Schmeichel et al., 2008). Incorporating these variables may explain additional variance in how people respond to the experimental manipulations used to evoke envy in the current studies. Individual differences may also help to discern the consequences of the discrete motivations that should foster self-regulation in the case of envy. In parallel to the findings of research on motivations to respond without prejudice (Plant & Devine, 1998), internal motivations to control envy (such as the hedonic motivation to decrease the associated negative affect) should result in the intrapsychic reduction of envious responding. In contrast, if people are predominantly motivated externally, i.e., by normative considerations, they should mainly control public signs of envy. As it has been argued that in some cultures envy has become a more accepted emotion in recent time (e.g., Matt, 2003), this question might also be addressed by a cross-cultural approach.

## Applied Perspectives

The conditions that led to more envy and a sizable increase in willingness to pay and purchase probability in the current experiments indicate that this particular emotional process may play an important role in influencing consumer behavior. Modern consumer societies not only provide abundant opportunities to compare own possessions to those of (superior) other people, but also offer nearly limitless occasions to engage in consumption. Faber and Vohs (2004) argue that the increased temporal or physical proximity (Hoch & Loewenstein, 1991) of consumers to desired products has greatly augmented the importance of impulsive precursors of consumption in recent times. For example, products have come closer to the consumer by the widespread use of direct marketing techniques, allowing people to make purchases without having to wait or travel to a store. Technological changes contribute to this tendency, making it possible to buy virtually every product at the press of a button (Faber & Vohs, 2004).

Furthermore, many settings of consumer decisions can be assumed to lead to a diminished mental capacity and thus to a constrained ability to exert self-control. For example, it has been argued that the number of options and thus choices that people can and must make when selecting products has increased exponentially over the last decades posing steadily rising demands on the limited mental resources of consumers (Vohs et al., 2008). Closely related, making deliberate, effortful choices itself has been shown to use up self regulatory resources (Vohs et al., 2008). Another reasonable assumption is that time pressure is an important factor in consumer decisions (e.g., Park, Iyer, & Smith, 1989). Thus, in many consumption situations, a constrained capability to exert self-control may be the rule rather than the exception.

An interesting example in this context is the psychology of auction situations. Auctions are an extensively used selling method, and a typical outcome is overbidding: people give bids that are too high given the value of the good (e.g., Delgado, Schotter, Ozbay, & Phelps, 2008; Ku, Malhotra, & Murnighan, 2005). Economists often explain this effect by referring to the notion of risk aversion, according to which the bid is influenced by the motivation to influence the probability of the outcome. Another explanation is the expected “joy of winning”. However, there is experimental evidence that overbidding is related to the anticipation of the unpleasant state associated with losing the auction (Delgado et al., 2008). Furthermore, Ku et al. (2005) stress the role of the escalation of commitment and rivalry in what they call “auction fever”. Their data suggest that both variables can cause overbidding and that this effect is mediated by “competitive” arousal. In the light of the current experiments, one might argue that envy is another (or partly overlapping) mechanism contributing to overbidding. Situational variables that should foster envious responding are present in many auction situations. Usually, both the (highly desired) object of the auction and one (or more) competitors are highly salient and in close proximity (albeit only their symbolic representation in the case of online auctions). Furthermore, many auction types imply high time pressure during their final stage. Thus, the mediating mechanism of a bid that exceeds the objective value of a good may be the envious impulse towards the competitor who has the highest bid at this moment and thus is the (virtual) possessor of the desired good.

In the light of the present findings, trying to provoke envy might at first glance seem a promising marketing strategy. If the default consequence of envy is an intensified longing and striving for the object or quality in question then causing envy

might increase the perceived desirability and in turn amplify sales. In fact, marketers often follow this strategy. For example, by showing advertisements depicting attractive people who enjoy the superior products they seemingly possess (Belk, 2008). According to the provocative title of a brochure of the marketing company Young & Rubicam (2006; cited in Van de Ven, Zeelenberg, & Pieters, 2009) “All you need is envy”. However, the current results show that this judgment is premature: Putting participants in an envy-provoking situation only led to more signs of heightened desire, when they were deprived of their cognitive resources. Thus, when trying to evoke and capitalize on envious impulses marketers would have to try to do so only when people’s capacity to exert self-control is constrained, a factor that might be very difficult to control. What should discourage them even more from trying to do so are the potential “sour grapes” and “sweet lemon” effects, which may lead to a decreased desire for the product that is marketed in a way to produce envy and to more satisfaction with the products that people already own.

Sometimes, envy is even openly used as a marketing device, as evidenced by the names of consumer products such as the “enV” mobile phone series by LG, “Nvidia” computer components, or the “Envy” perfume by Gucci. In these cases, the intention probably is to make use of another way in which envy might be important in marketing. Products are often marketed with the (explicit or implicit) promise to provoke envy in the social environment of their buyers. Here, the aim is to take advantage of the human tendency to engage in conspicuous consumption (Veblen, 1899), which is the spending on goods with the sole purpose to display ones superiority and social status. The present findings are less directly related to this phenomenon. Still, one may speculate how self-

control is related to conspicuous consumption. The prospect of being envied by others might be something that people spontaneously find very positive upon perceiving the opportunity to gain an advantage and raise their social status. Irvine (2006) argues that people have a desire to cause envy in others. On the other hand, social norms should inhibit such a behavior, as argued by sociologists. An example is provided by anecdotal evidence on the cultural instilment of the fear of being the target of “the evil eye”, which is supposedly aimed at preventing the negative consequences of envy (e.g., Douglas & Isherwood, 1979; Foster, 1972;). Therefore, on second thought, people might find the prospect of being envied less appealing. Consequentially, they might be particularly vulnerable to the propensity to engage in conspicuous consumption when being deprived of mental resources.

The implications of the present theoretical arguments and experimental findings can also be viewed from another applied perspective: Most relevant for consumers might be the question of which ways are best to escape the detrimental effects of envy when making judgments and decisions. Gross’ (1998a) classification of the ways of emotion regulation offers a framework to answer that question. If avoiding the potentially envy-involving situation is not an option then people may try to alter it. Specifically, people should ensure that they are able to devote the necessary resources to keep envy from biasing them. For example, they could postpone a decision to gain more time for deliberate thought. They might also try to use strategies that help them reduce the amount of information and thus cognitive overload and the complexity of the decision. When having enough cognitive resources, participants of the present experiments did not fall for envy’s tendency to increase the desire for the superior good

of a neighbor (but note that there were some indications of evaluative contrast effects). As mentioned above, a possible explanation for this effect is that they have resorted to the means of cognitively changing the meaning they ascribe to the envy-evoking object. In the case of consumer decisions, a way to accomplish this may be to deliberately focus on the costs of making a purchase, such as considering other uses of the money, or to think about negative aspects of the product and the negative consequences of purchasing it (see also Faber & Vohs, 2004). Finally, provided they dispose of the necessary mental resources, consumers have the option to use a response-focused emotion regulation strategy such as suppressing the behavioral effects of envy. Future research should elaborate the effectiveness and the specific consequences of these envy-control mechanisms in consumer situations.

## Conclusion

The present findings help understand the intricacies of envy and thus demonstrate the usefulness of applying a social cognitive approach to the investigation of envious thoughts, feelings, and behavior. The consequences of an envy-provoking situation hinge on people's mental capacity to control and alter their emotional responding. Because envy is painful and norm-violating, people can be expected to try to control their overt as well as intrapsychic envious reactions. In the light of the multiple demands on people's limited capacities, however, in many situations they are unlikely to prevail against their invidious impulse. Thus, in order to avoid being influenced by envy, people should steer clear from important decisions when they are fatigued, under time pressure, or overloaded with information. The present experiments

contribute to the knowledge about when and how emotion influences economic judgments and decisions. If uncontrolled, envy may lead to objectively unjustifiable overvaluations of products and options others have and may thus fuel irrationality in human decision making.

## References

- Aarts, H., Gollwitzer, P. M., & Hassin, R. R. (2004). Goal contagion: Perceiving is for pursuing. *Journal of Personality and Social Psychology, 87*, 23-37. doi: 10.1037/0022-3514.87.1.23.
- Alighieri, D. (2004). *The divine comedy*. (J. Ciardi, Trans.). New York: New American Library. (Original work published in 1312)
- Aristotle. (1929). *Art of rhetoric*. (J. H. Freese, Trans.). Cambridge: Harvard University Press.
- Balcetis, E., & Dunning, D. (2006). See what you want to see: Motivational influences on visual perception. *Journal of Personality and Social Psychology, 91*, 612-625. doi: 10.1037/0022-3514.91.4.612.
- Bargh, J. A., & Williams, L. E. (2006). The nonconscious regulation of emotion. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 429-445). New York: Guilford Press.
- Barnett, H. (1953). *Innovation: The basis of cultural change*. New York: McGraw-Hill.
- Baron, R. M., & Kenny, D. A. (1986). The moderator mediator variable distinction in social psychological-research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173-1182. doi: 10.1037/0022-3514.51.6.1173.



- Baron, R. S. (1986). Distraction-conflict theory: Progress and problems. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 19, pp. 1-40). New York: Academic Press.
- Barrett, L. F., Ochsner, K. N., & Gross, J. J. (2007). On the automaticity of emotion. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 173–217). New York: Psychology Press.
- Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology, 74*, 1252-1265. doi: 10.1037/0022-3514.74.5.1252.
- Baumeister, R. F., Sparks, E. A., Stillman, T. F., & Vohs, K. D. (2008). Free will in consumer behavior: Self-control, ego depletion, and choice. *Journal of Consumer Psychology, 18*, 4-13. doi: 10.1016/j.jcps.2007.10.002.
- Baumeister, R. F., & Vohs, K. D. (2004). *Handbook of self-regulation*. New York: Guilford Press.
- Belk, R. W. (2008). Marketing and envy. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 211-226). New York: Oxford University Press.
- Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 1-62). New York: Academic Press.
- Ben-Ze'ev, A. (2001). *The subtlety of emotions*. Cambridge, MA: MIT Press.
- Bers, S., & Rodin, J. (1984). Social-comparison jealousy: A developmental and motivational study. *Journal of Personality and Social Psychology, 47*, 766-779. doi: 10.1037/0022-3514.47.4.766.

- Blair, I. V. (2002). The malleability of automatic stereotypes and prejudice. *Personality and Social Psychology Review*, *6*, 242-261. doi: 10.1207/S15327957PSPR0603\_8.
- Blair, I. V., Ma, J. E., & Lenton, A. P. (2001). Imagining stereotypes away: The moderation of implicit stereotypes through mental imagery. *Journal of Personality and Social Psychology*, *81*, 828-841. doi: 10.1037//0022-3514.81.5.828.
- Blanton, H., & Stapel, D. A. (2008). Unconscious and spontaneous and ... complex: The three selves model of social comparison assimilation and contrast. *Journal of Personality and Social Psychology*, *94*, 1018-1032. doi: 10.1037/0022-3514.94.6.1018.
- Bozzolo, A. M., & Brock, T. C. (1992). Unavailability effects on message processing: A theoretical analysis and an empirical test. *Basic & Applied Social Psychology*, *13*, 93-101. doi: 10.1207/s15324834basp1301\_8.
- Brannon, L. A., & Brock, T. C. (2001a). Limiting time for responding enhances behavior corresponding to the merits of compliance appeals: Refutations of heuristic-cue theory in service and consumer settings. *Journal of Consumer Psychology*, *10*, 135-146. doi: 10.2307/1480315.
- Brannon, L. A., & Brock, T. C. (2001b). Scarcity claims elicit extreme responding to persuasive messages: Role of cognitive elaboration. *Personality and Social Psychology Bulletin*, *27*, 365-375. doi: 10.1177/0146167201273010.
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York: Academic Press.

- Brehm, J. W., Stires, L. K., Sensenig, J., & Shaban, J. (1966). The attractiveness of an eliminated choice alternative. *Journal of Experimental Social Psychology, 2*, 301-313. doi: 10.1016/0022-1031(66)90086-2.
- Brock, T. C. (1968). Implications of commodity theory for value change. In A. G. Greenwald, T. C. Brock, & T. M. Ostrom (Eds.), *Psychological foundations of attitudes* (pp. 243-275). New York: Academic Press.
- Brock, T. C., & Mazzocco, P. (2004). Responses to scarcity: A commodity theory perspective on reactance and rumination. In R. A. Wright, J. Greenberg, & S. S. Brehm (Eds.), *Motivational analyses of social behavior: Building on Jack Brehm's contributions to psychology* (pp. 129-148). Mahwah, NJ: Lawrence Erlbaum.
- Brock, T. C., & Brannon, L. A. (1992). Liberalization of commodity theory. *Basic & Applied Social Psychology, 13*, 135-144. doi: 10.1207/s15324834basp1301\_11.
- Bruner, J. S., & Goodman, C. C. (1947). Value and need as organizing factors in perception. *The Journal of Abnormal and Social Psychology, 42*, 33-44. doi: 10.1037/h0058484.
- Buckingham, J. T., & Alicke, M. D. (2002). The influence of individual versus aggregate social comparison and the presence of others on self-evaluations. *Journal of Personality and Social Psychology, 83*, 1117-1130. doi: 10.1037/0022-3514.83.5.1117.

- Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology, 54*, 616-628. doi: 10.1037/0022-3514.54.4.616.
- Buss, D. M. (1989). Conflict between the sexes: Strategic interference and the evocation of anger and upset. *Journal of Personality and Social Psychology, 56*, 735-747. doi: 10.1037/0022-3514.56.5.735.
- Buss, D. M., & Dedden, L. A. (1990). Derogation of competitors. *Journal of Social and Personal Relationships, 7*, 395-422. doi: 10.1177/0265407590073006.
- Cacioppo, J. T., Priester, J. R., & Berntson, G. G. (1993). Rudimentary determinants of attitudes: II. Arm flexion and extension have differential-effects on attitudes. *Journal of Personality and Social Psychology, 65*, 5-17. doi: 10.1037/0022-3514.65.1.5.
- Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology, 39*, 752-766. doi: 10.1037/0022-3514.39.5.752.
- Chaiken, S., & Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. New York: Guilford.
- Chen, M., & Bargh, J. A. (1999). Consequences of automatic evaluation: Immediate behavioral predispositions to approach or avoid the stimulus. *Personality and Social Psychology Bulletin, 25*, 215-224. doi: 10.1177/0146167299025002007.
- Cialdini, R. B. (1987). Compliance principles of compliance professionals: Psychologists of necessity. In M. P. Zanna, J. M. Olson, & C. Hermans (Eds.),

- The Ontario symposium: Vol. 5. Social influence* (pp. 165-183). Hillsdale, NJ: Academic Press.
- Cialdini, R. B. (1993). *Influence: Science and practice* (3rd ed.). New York: HarperCollins.
- Clore, G. L., & Ortony, A. (2000). Cognition in emotion: Always, sometimes, or never? In R. D. Dane & L. Nadel (Eds.), *Cognitive neuroscience of emotion* (pp. 24-61). New York: Oxford University Press.
- Corneo, G., & Jeanne, O. (2001). On relative-wealth effects and long-run growth. *Research in Economics*, 55, 349-358. doi: 10.1006/reec.2001.0260.
- Crosby, F., Muehrer, P., & Loewenstein, G. (1986). Relative deprivation and explanation: Models and concepts. In J. M. Olson, C. Herman, & M. P. Zanna (Eds.), *Relative Deprivation and Social Comparison* (Vol. 4, pp. 17-32). Hillsdale, NJ: Lawrence Erlbaum.
- Curtin, J. J., & Lang, A. (2007). Alcohol and emotion: Insights and directives from affective science. In J. Rottenberg & S. Johnson (Eds.), *Emotion and psychopathology: Bridging affective and clinical science* (pp. 191-213). Washington, DC: APA.
- Curtin, J. J., & Fairchild, B. A. (2003). Alcohol and cognitive control: Implications for regulation of behavior during response conflict. *Journal of Abnormal Psychology*, 112, 424-436. doi: 10.1037/0021-843X.112.3.424.
- Dasgupta, N., & Rivera, L. M. (2006). From automatic antigay prejudice to behavior: The moderating role of conscious beliefs about gender and behavioral control.

- Journal of Personality and Social Psychology*, 91, 268-280. doi: 10.1037/0022-3514.91.2.268.
- De Houwer, J. (2007). A conceptual and theoretical analysis of evaluative conditioning. *Spanish Journal of Psychology*, 10, 230-241.
- De la Mora, G. F. (1987). *Egalitarian envy: The political foundations of social justice*. (A. T. de Nicolas, Tran.). New York: Paragon House.
- Delgado, M. R., Schotter, A., Ozbay, E. Y., & Phelps, E. A. (2008). Understanding overbidding: Using the neural circuitry of reward to design economic auctions. *Science*, 321, 1849-1852. doi: 10.1126/science.1158860.
- Dijksterhuis, A., Chartrand, T., & Aarts, H. (2007). Effects of priming and perception on social behavior and goal pursuit. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 51-132). Philadelphia: Psychology Press.
- Ditto, P. H., & Jemmott, J. B. (1989). From rarity to evaluative extremity: Effects of prevalence information on evaluations of positive and negative characteristics. *Journal of Personality and Social Psychology*, 57, 16-26. doi: 10.1037/0022-3514.57.1.16.
- Douglas, M., & Isherwood, B. C. (1979). *The world of goods*. New York: Basic Books.
- Dunning, D., & Hayes, A. (1996). Evidence for egocentric comparison in social judgment. *Journal of Personality and Social Psychology*, 71, 213-229. doi: 10.1037/0022-3514.71.2.213.

- Eder, A., & Rothermund, K. (2008). When do motor behaviors (mis)match affective stimuli? An evaluative coding view of approach and avoidance reactions. *Journal of Experimental Psychology: General*, *137*, 262-281. doi: 10.1037/0096-3445.137.2.262.
- Elster, J. (1985). *Sour grapes: Studies in the subversion of rationality*. Cambridge, UK: Cambridge University Press.
- Elster, J. (1999). *Alchemies of the mind*. Cambridge, UK: Cambridge University Press.
- Envy. (2009). *Merriam Webster's online dictionary*. Retrieved April 23, 2009, from <http://www.merriam-webster.com/dictionary/envy>.
- Epley, N., & Gilovich, T. (2006). The anchoring-and-adjustment heuristic: Why the adjustments are insufficient. *Psychological Science*, *17*, 311-318. doi: 10.1111/j.1467-9280.2006.01704.x.
- Epstein, J. (2003). *Envy*. New York: Oxford University Press.
- Epstein, S. (1994). Integration of the cognitive and the psychodynamic unconscious. *American Psychologist*, *49*, 709-724. doi: 10.1037/0003-066X.49.8.709.
- Evans, J. S. B. T. (2008). Dual-processing accounts of reasoning, judgment, and social cognition. *Annual Review of Psychology*, *59*, 255-278. doi: 10.1146/annurev.psych.59.103006.093629.
- Faber, R. J., & Vohs, K. D. (2004). To buy or not to buy? Self-control and self-regulatory failure in purchase behavior. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 509-524). New York: Guilford.

- Farber, L. (1966). *Ways of the will*. New York: Basic Books.
- Fazio, R. H. (1990). Multiple processes by which attitudes guide behavior: The MODE model as an integrative framework. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 23, pp. 75-109). San Diego, CA: Academic Press.
- Ferguson, M., & Bargh, J. (2004). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology*, 87, 557-572. doi: 10.1037/0022-3514.87.5.557.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117. doi: 10.1177/001872675400700202.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.
- Fillmore, M., & Vogel-Sprott, M. (1999). An alcohol model of impaired inhibitory control and its treatment in humans. *Experimental and Clinical Psychopharmacology*, 7, 49-55. doi: 10.1037/1064-1297.7.1.49.
- Fischer, A. H., Manstead, A. S. R., Evers, C., Timmers, M., & Valk, G. (2004). Motives and norms underlying emotion regulation. In P. Philippot & R. S. Feldman (Eds.), *The regulation of emotion* (pp. 189-210). Mahwah, NJ: Lawrence Erlbaum.
- Foster, G. M. (1972). The anatomy of envy: A study in symbolic behavior. *Current Anthropology*, 13, 165-202. doi: 10.1086/201267.



- Fox, E., Russo, R., & Dutton, K. (2002). Attentional bias for threat: Evidence for delayed disengagement from emotional faces. *Cognition & Emotion, 16*, 355-379. doi: 10.1080/02699930143000527.
- Frank, R. H. (2000). *Luxury fever*. Princeton: Princeton University Press.
- Frijda, N. H. (1986). *The emotions*. London: Cambridge University Press.
- Frijda, N. H. (1988). The laws of emotion. *American Psychologist, 43*, 349-358. doi: 10.1037/0003-066X.43.5.349.
- Frijda, N. H., & Zeelenberg, M. (2001). Appraisal: What is the dependent? In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 141-155). New York: Oxford University Press.
- Garner, B. A. (1998). Sour grapes. In *A dictionary of modern American usage* (p. 723). New York: Oxford University Press.
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin, 132*, 692-731. doi: 10.1037/0033-2909.132.5.692.
- Giancola, P. R., & Corman, M. D. (2007). Alcohol and aggression: A test of the Attention-Allocation Model. *Psychological Science, 18*, 649-655. doi: 10.1111/j.1467-9280.2007.01953.x.
- Gibson, B. (2008). Can evaluative conditioning change attitudes toward mature brands? New evidence from the Implicit Association Test. *Journal of Consumer Research, 35*, 178-188. doi: 10.1086/527341.

- Gilbert, D. T., Giesler, R. B., & Morris, K. A. (1995). When comparisons arise. *Journal of Personality and Social Psychology*, *69*, 227-236. doi: 10.1037/0022-3514.69.2.227.
- Gilbert, D. T., Pelham, B. W., & Krull, D. S. (1988). On cognitive busyness: When person perceivers meet persons perceived. *Journal of Personality and Social Psychology*, *54*, 733-740. doi: 10.1037/0022-3514.54.5.733.
- Girard, R. (1979). *Violence and the sacred*. (P. Gregory, Tran.). Baltimore: John Hopkins University Press.
- Girard, R. (2001). *I see Satan fall like lightning*. Maryknoll, NY: Orbis Books.
- Gregg, A., Seibt, B., & Banaji, M. (2006). Easier done than undone: Asymmetry in the malleability of implicit preferences. *Journal of Personality and Social Psychology*, *90*, 1-20. doi: 10.1037/0022-3514.90.1.1.
- Gross, J. J. (Ed.). (2006). *Handbook of emotion regulation*. New York: Guilford Press.
- Gross, J. J. (1998a). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, *2*, 271-299. doi: 10.1037/1089-2680.2.3.271.
- Gross, J. J. (1998b). Antecedent- and response-focused emotion regulation: Divergent consequences for experience, expression, and physiology. *Journal of Personality and Social Psychology*, *74*, 224-237. doi: 10.1037/0022-3514.74.1.224.
- Gross, J. J. (2002). Emotion regulation: Affective, cognitive, and social consequences. *Psychophysiology*, *39*, 281-291. doi: 10.1017/S0048577201393198.

- Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review*, *108*, 814-834. doi: 10.1037/0033-295X.108.4.814.
- Hassin, R. R., Uleman, J. S., & Bargh, J. A. (Eds.). (2004). *The new unconscious*. New York: Oxford University Press.
- Hetherington, M. M., Anderson, A. S., Norton, G. N., & Newson, L. (2006). Situational effects on meal intake: A comparison of eating alone and eating with others. *Physiology & Behavior*, *88*, 498-505. doi: 10.1016/j.physbeh.2006.04.025.
- Hill, S. E., & Buss, D. M. (2008). The evolutionary psychology of envy. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 60-70). New York: Oxford University Press.
- Hill, S. E., & Buss, D. M. (2006). Envy and positional bias in the evolutionary psychology of management. *Managerial & Decision Economics*, *27*, 131-143. doi: 10.1002/mde.1288.
- Hoch, S. J., & Loewenstein, G. F. (1991). Time-inconsistent preferences and consumer self-control. *The Journal of Consumer Research*, *17*, 492-507. doi: 10.1086/208573.
- Hofmann, W., Friese, M., & Gschwendner, T. (2009). Men on the "pull": Automatic approach-avoidance tendencies and sexual interest behavior. *Social Psychology*, *2*, 73-78. doi: 10.1027/1864-9335.40.2.73.

- Hofmann, W., & Friese, M. (2008). Impulses got the better of me: Alcohol moderates the influence of implicit attitudes toward food cues on eating behavior. *Journal of Abnormal Psychology, 117*, 420-7. doi: 10.1037/0021-843X.117.2.420.
- Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and self-control from a dual-systems perspective. *Perspectives on Psychological Science, 4*, 162-176. doi: 10.1111/j.1745-6924.2009.01116.x.
- Hofmann, W., Gschwendner, T., Friese, M., Wiers, R. W., & Schmitt, M. (2008). Working memory capacity and self-regulatory behavior: Toward an individual differences perspective on behavior determination by automatic versus controlled processes. *Journal of Personality and Social Psychology, 95*, 962-977. doi: 10.1037/a0012705.
- Huguet, P., Galvaing, M. P., Monteil, J. M., & Dumas, F. (1999). Social presence effects in the Stroop task: Further evidence for an attentional view of social facilitation. *Journal of Personality and Social Psychology, 77*, 1011-1025. doi: 10.1037/0022-3514.77.5.1011.
- Hull, J., & Bond, C. (1986). Social and behavioral consequences of alcohol consumption and expectancy: A meta-analysis. *Psychological Bulletin, 99*, 347-360. doi: 10.1037/0033-2909.99.3.347.
- Irvine, W. B. (2006). *On desire: Why we want what we want*. New York: Oxford University Press.

- Joseph, J. E., Powell, C. A. J., Johnson, N. F., & Kedia, G. (2008). The functional neuroanatomy of envy. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 245-263). New York: Oxford University Press.
- Kant, I. (1797). *Die Metaphysik der Sitten*. Königsberg: Friedrich Nicolovius.
- Kay, A. C., Wheeler, S. C., Bargh, J. A., & Ross, L. (2004). Material priming: The influence of mundane physical objects on situational construal and competitive behavioral choice. *Organizational Behavior and Human Decision Processes*, 95, 83-96. doi: 10.1016/j.obhdp.2004.06.003.
- Kay, A. C., Jimenez, M. C., & Jost, J. T. (2002). Sour grapes, sweet lemons, and the anticipatory rationalization of the status quo. *Personality and Social Psychology Bulletin*, 28, 1300-1312. doi: 10.1177/01461672022812014.
- Klein, M. (1957). *Envy and gratitude*. New York: Routledge.
- Kruglanski, A. W. (1996). Motivated social cognition: Principles of the interface. In *Social psychology: Handbook of basic principles* (pp. 493–520). New York: Guilford Press.
- Ku, G., Malhotra, D., & Murnighan, J. K. (2005). Towards a competitive arousal model of decision-making: A study of auction fever in live and Internet auctions. *Organizational Behavior and Human Decision Processes*, 96, 89-103. doi: 10.1016/j.obhdp.2004.10.001.
- Kunda, Z. (1990). The case for motivated reasoning. *Psychological Bulletin*, 108, 480-498. doi: 10.1037/0033-2909.108.3.480.

- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1990). Emotion, attention, and the startle reflex. *Psychological Review*, *97*, 377-395. doi: 10.1037/0033-295X.97.3.377.
- Leach, C. W. (2008). Envy, inferiority, and injustice: Three bases of anger about inequality. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 60-70). New York: Oxford University Press.
- Lindholm, C. (2008). Culture and envy. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 227-244). New York: Oxford University Press.
- Lynn, M. (1991). Scarcity effects on value: A quantitative review of the commodity theory literature. *Psychology and Marketing*, *8*, 43-57. doi: 10.1002/mar.4220080105.
- Lyvers, M. (2000). "Loss of control" in alcoholism and drug addiction: A neuroscientific interpretation. *Experimental and Clinical Psychopharmacology*, *8*, 225-249. doi: 10.1037/1064-1297.8.2.225.
- MacDonald, T. K., Fong, G. T., Zanna, M. P., & Martineau, A. M. (2000). Alcohol myopia and condom use: Can alcohol intoxication be associated with more prudent behavior? *Journal of Personality and Social Psychology*, *78*, 605-619. doi: 10.1037/0022-3514.78.4.605.
- MacLeod, C., Mathews, A., & Tata, P. (1986). Attentional bias in emotional disorders. *Journal of Abnormal Psychology*, *95*, 15-20. doi: 10.1037/0021-843X.95.1.15.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., & Ford, R. L. (1997). On regulation of recollection: The intentional forgetting of stereotypical memories. *Journal of*

- Personality and Social Psychology*, 72, 709-719. doi: 10.1037/0022-3514.72.4.709.
- Maner, J. K., Gailliot, M. T., Rouby, D. A., & Miller, S. L. (2007). Can't take my eyes off you: Attentional adhesion to mates and rivals. *Journal of Personality and Social Psychology*, 93, 389-401. doi: 10.1037/0022-3514.93.3.389.
- Markman, A. B., & Brendl, C. M. (2005). Constraining theories of embodied cognition. *Psychological Science*, 16, 6-10. doi: 10.1111/j.0956-7976.2005.00772.x.
- Marlatt, G. A., & Rohsenow, D. J. (1980). Cognitive processes in alcohol use: Expectancy and the balanced placebo design. In N. K. Mello (Ed.), *Advances in substance abuse: Behavioral and biological research* (pp. 159-199). Greenwich, CT: JAI Press.
- Matt, S. J. (2003). *Keeping up with the Joneses: Envy in American consumer society, 1890-1930*. Philadelphia: University of Pennsylvania Press.
- Mauss, I. B., Bunge, S. A., & Gross, J. J. (2007). Automatic emotion regulation. *Social and Personality Psychology Compass*, 1, 146-167. doi: 10.1111/j.1751-9004.2007.00005.x.
- McGuire, W., & McGuire, C. V. (1991). The content, structure, and operation of thought systems. In R. S. Wyer & T. K. Srull (Eds.), *Advances in social cognition* (Vol. 4, pp. 1-78). Hillsdale, NJ: Lawrence Erlbaum.
- Metcalf, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review*, 106, 3-19. doi: 10.1037/0033-295X.106.1.3.

- Miceli, M., & Castelfranchi, C. (2007). The envious mind. *Cognition & Emotion, 21*, 449-479. doi: 10.1080/02699930600814735.
- Moskowitz, G. B. (2002). Preconscious effects of temporary goals on attention. *Journal of Experimental Social Psychology, 38*, 397-404. doi: 10.1016/S0022-1031(02)00001-X.
- Muller, D., Judd, C. M., & Yzerbyt, V. Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology, 89*, 852-863. doi: 10.1037/0022-3514.89.6.852.
- Mussweiler, T. (2003). Comparison processes in social judgment: Mechanisms and consequences. *Psychological Review, 110*, 472-489. doi: 10.1037/0033-295X.110.3.472.
- Mussweiler, T., & Rüter, K. (2003). What friends are for! The use of routine standards in social comparison. *Journal of Personality and Social Psychology, 85*, 467-481. doi: 10.1037/0022-3514.85.3.467.
- Mussweiler, T., Rüter, K., & Epstude, K. (2004). The man who wasn't there: Subliminal social comparison standards influence self-evaluation. *Journal of Experimental Social Psychology, 40*, 689-696. doi: 10.1016/j.jesp.2004.01.004.
- Mussweiler, T., & Epstude, K. (2009). Relatively fast! Efficiency advantages of comparative thinking. *Journal of Experimental Psychology: General, 138*, 1-21. doi: 10.1037/a0014374.
- Neu, J. (1980). Jealous thoughts. In A. O. Rorty (Ed.), *Explaining emotions* (pp. 425-463). Berkeley: University of California Press.



- Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, 9, 242-249. doi: 10.1016/j.tics.2005.03.010.
- Olson, J. M., & Hazlewood, J. (1986). Relative deprivation and social comparison: An integrative perspective. In J. M. Olson, C. Herman, & M. P. Zanna (Eds.), *Relative deprivation and social comparison: The Ontario symposium*, Vol. 4 (pp. 1-15). Hillsdale: NJ: Erlbaum.
- Olson, M., & Fazio, R. (2004). Trait inferences as a function of automatically activated racial attitudes and motivation to control prejudiced reactions. *Basic and Applied Social Psychology*, 26, 1-11. doi: 10.1207/s15324834basp2601\_1.
- Park, C. W., Iyer, E. S., & Smith, D. C. (1989). The effects of situational factors on in-store grocery shopping behavior: The role of store environment and time available for shopping. *The Journal of Consumer Research*, 15, 422-433. doi: 10.2307/2489539.
- Parrott, W. G., & Smith, R. H. (1993). Distinguishing the experiences of envy and jealousy. *Journal of Personality and Social Psychology*, 64, 906-920. doi: 10.1037/0022-3514.64.6.906.
- Parrott, W. G. (2001). The emotional experiences of envy and jealousy. In W. G. Parrott (Ed.), *Emotions in social psychology: Essential readings* (pp. 306-320). Philadelphia: Psychology Press.
- Petty, R. E., Fazio, R. H., & Briñol, P. (Eds.). (2008). *Attitudes: Insights from the new implicit measures*. New York: Psychology Press.

- Plant, E. A., & Devine, P. G. (1998). Internal and external motivation to respond without prejudice. *Journal of Personality and Social Psychology*, *75*, 811-832. doi: 10.1037/0022-3514.75.3.811.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, *42*, 185-227. doi: 10.1080/00273170701341316.
- Rawls, J. (1999). *A theory of justice (Rev. ed.)*. Cambridge, MA: Harvard University Press. (Original work published in 1971)
- Richards, J. M., & Gross, J. J. (2000). Emotion regulation and memory: The cognitive costs of keeping one's cool. *Journal of Personality and Social Psychology*, *79*, 410-424. doi: 10.1037/0022-3514.79.3.410.
- Robinson, T. E., & Berridge, K. C. (1993). The neural basis of drug craving: An incentive-sensitization theory of addiction. *Brain Research Reviews*, *18*, 247-291. doi: 10.1016/0165-0173(93)90013-P.
- Robinson, T. E., & Berridge, K. C. (2001). Incentive-sensitization and addiction. *Addiction*, *96*, 103-114. doi: 10.1046/j.1360-0443.2001.9611038.x.
- Roseman, I. J. (1984). Cognitive determinants of emotion: A structural theory. *Review of Personality and Social Psychology*, *5*, 11-36.
- Russell, B. (1930). *The conquest of happiness*. London: Allen & Unwin.
- Salovey, P., & Rodin, J. (1984). Some antecedents and consequences of social-comparison jealousy. *Journal of Personality and Social Psychology*, *47*, 780-792. doi: 10.1037/0022-3514.47.4.780.

- Salovey, P., & Rodin, J. (1986). The differentiation of social-comparison jealousy and romantic jealousy. *Journal of Personality and Social Psychology*, *50*, 1100-1112. doi: 10.1037/0022-3514.50.6.1100.
- Scherer, K. R. (1984). On the nature and function of emotion: A component process approach. In K. R. Scherer & P. Ekman (Eds.), *Approaches to Emotion* (pp. 293-317). Hillsdale, NJ: Erlbaum.
- Scherer, K. R., Schorr, A., & Johnstone, T. (Eds.). (2001). *Appraisal processes in emotion: Theory, methods, research*. New York: Oxford University Press.
- Schmeichel, B. J. (2007). Attention control, memory updating, and emotion regulation temporarily reduce the capacity for executive control. *Journal of Experimental Psychology: General*, *136*, 241-255. doi: 10.1037/0096-3445.136.2.241.
- Schmeichel, B. J., Volokhov, R. N., & Demaree, H. A. (2008). Working memory capacity and the self-regulation of emotional expression and experience. *Journal of Personality and Social Psychology*, *95*, 1526-1540. doi: 10.1037/a0013345.
- Schneider, W., & Shiffrin, R. M. (1977). Controlled and automatic human information processing: I. Detection, search, and attention. *Psychological Review*, *84*, 1-66. doi: 10.1037/0033-295X.84.1.1.
- Schoeck, H. (1971). *Der Neid und die Gesellschaft*. Freiburg: Herder.
- Schweiger Gallo, I., Keil, A., McCulloch, K. C., Rockstroh, B., & Gollwitzer, P. M. (2009). Strategic automation of emotion regulation. *Journal of Personality and Social Psychology*, *96*, 11-31. doi: 10.1037/a0013460.

- Seibt, B., Häfner, M., Strack, F., & Deutsch, R. (2008, July). The automatic regulation of basic needs: Food and sexual deprivation prepare us to approach relevant stimuli. Paper presented at the International Congress of Psychology. Berlin, Germany.
- Seibt, B., Häfner, M., & Deutsch, R. (2007). Prepared to eat: How immediate affective and motivational responses to food cues are influenced by food deprivation. *European Journal of Social Psychology, 37*, 359-379. doi: 10.1002/ejsp.365.
- Seibt, B., Neumann, R., Nussinson, R., & Strack, F. (2008). Movement direction or change in distance? Self- and object-related approach-avoidance motions. *Journal of Experimental Social Psychology, 44*, 713-720. doi: 10.1016/j.jesp.2007.04.013.
- Shiv, B., & Fedorikhin, A. (1999). Heart and mind in conflict: The interplay of affect and cognition in consumer decision making. *Journal of Consumer Research, 26*, 278-292. doi: 10.1086/209563.
- Siemer, M., & Reisenzein, R. (1998). Effects of mood on evaluative judgements: Influence of reduced processing capacity and mood salience. *Cognition and Emotion, 12*, 783-805. doi: 10.1080/026999398379439.
- Simon, H. A. (1983). *Reason in human affairs*. Stanford, CA: Stanford University Press.
- Sinclair, L., & Kunda, Z. (1999). Reactions to a black professional: Motivated inhibition and activation of conflicting stereotypes. *Journal of Personality and Social Psychology, 77*, 885-904. doi: 10.1037/0022-3514.77.5.885.

- Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48*, 813-838. doi: 10.1037/0022-3514.48.4.813.
- Smith, C. A., & Kirby, L. D. (2001). Toward delivering on the promise of appraisal theory. In K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 121-138). New York: Oxford University Press.
- Smith, E. R., & DeCoster, J. (2000). Dual-process models in social and cognitive psychology: Conceptual integration and links to underlying memory systems. *Personality and Social Psychology Review, 4*, 108-131. doi: 10.1207/S15327957PSPR0402\_01.
- Smith, E. R., & Neumann, R. (2005). Emotion processes considered from the perspective of dual-process models. In L. F. Barrett, P. M. Niedenthal, & P. Winkielman (Eds.), *Emotion and consciousness* (pp. 287-311). New York: Guilford Press.
- Smith, R. H., & Kim, S. H. (2007). Comprehending envy. *Psychological Bulletin, 133*, 46-64. doi: 10.1037/0033-2909.133.1.46.
- Smith, R. H., Kim, S. H., & Parrott, W. G. (1988). Envy and jealousy: Semantic problems and experiential distinctions. *Personality and Social Psychology Bulletin, 14*, 401-409. doi: 10.1177/0146167288142017.

- Smith, R. H., Parrott, W., Diener, E., Hoyle, R., & Kim, S. (1999). Dispositional envy. *Personality and Social Psychology Bulletin*, *25*, 1007-1020. doi: 10.1177/01461672992511008.
- Smith, R. H., Parrott, W. G., Ozer, D., & Moniz, A. (1994). Subjective injustice and inferiority as predictors of hostile and depressive feelings in envy. *Personality and Social Psychology Bulletin*, *20*, 705-711. doi: 10.1177/0146167294206008.
- Spencer, S. J., Fein, S., Wolfe, C. T., Fong, C., & Duinn, M. A. (1998). Automatic Activation of Stereotypes: The Role of Self-Image Threat. *Pers Soc Psychol Bull*, *24*, 1139-1152. doi: 10.1177/01461672982411001.
- Steele, C., & Josephs, R. (1990). Alcohol myopia: Its prized and dangerous effects. *American Psychologist*, *45*, 921-933. doi: 10.1037/0003-066X.45.8.921.
- Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, *8*, 220-247. doi: 10.1207/s15327957pspr0803\_1.
- Strack, F., Werth, L., & Deutsch, R. (2006). Reflective and impulsive determinants of consumer behavior. *Journal of Consumer Psychology*, *16*, 205-216. doi: 10.1207/s15327663jcp1603\_2.
- Suls, J. M., & Wheeler, L. (Eds.). (2000). *Handbook of social comparison*. New York: Kluwer Academic/Plenum Publishers.
- Sutton, S. K., & Davidson, R. J. (1997). Prefrontal brain asymmetry: A biological substrate of the behavioral approach and inhibition systems. *Psychological Science*, *8*, 204-210. doi: 10.1111/j.1467-9280.1997.tb00413.x.

- Takahashi, H., Kato, M., Matsuura, M., Mobbs, D., Suhara, T., & Okubo, Y. (2009). When your gain is my pain and your pain is my gain: Neural correlates of envy and schadenfreude. *Science*, *323*, 937-939. doi: 10.1126/science.1165604.
- Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality*, *72*, 271-324. doi: 10.1111/j.0022-3506.2004.00263.x.
- Taylor, G. (2006). *Deadly vices*. New York: Oxford University Press.
- Tedeschi, J. T., Schlenker, B. R., & Bonoma, T. V. (1971). Cognitive dissonance: Private ratiocination or public spectacle. *American Psychologist*, *26*, 685-695. doi: 10.1037/h0032110.
- Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21, pp. 181-227). New York: Academic Press.
- Tesser, A., & Paulhus, D. (1983). The definition of self: Private and public self-evaluation management strategies. *Journal of Personality and Social Psychology*, *44*, 672-682. doi: 10.1037/0022-3514.44.4.672.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, *185*, 1124-1131. doi: 10.1126/science.185.4157.1124.
- Van de Ven, N., Zeelenberg, M., & Pieters, R. (2009). Leveling up and down: The experience of benign and malicious envy. *Emotion*, *3*, 419-429. doi: 10.1037/a0015669.
- Veblen, T. (1899). *The theory of the leisure class*. Amherst, NY: Prometheus Books.

- Veltkamp, M., Aarts, H., & Custers, R. (2008). Perception in the service of goal pursuit: Motivation to attain goals enhances the perceived size of goal-instrumental objects. *Social Cognition, 26*, 720-736. doi: 10.1521/soco.2008.26.6.720.
- Vohs, K. D., Baumeister, R. F., Schmeichel, B. J., Twenge, J., Nelson, N. M., & Tice, D. M. (2008). Making choices impairs subsequent self-control: A limited-resource account of decision making, self-regulation, and active initiative. *Journal of Personality and Social Psychology, 94*, 883-898. doi: 10.1037/0022-3514.94.5.883.
- Vohs, K. D., & Heatherton, T. F. (2000). Self-regulatory failure: A resource-depletion approach. *Psychological Science, 11*, 249-54. doi: 10.1111/1467-9280.00250.
- Vohs, K. D., & Baumeister, R. F. (2004). Understanding self-regulation: An introduction. In R. F. Baumeister & K. D. Vohs (Eds.), *Handbook of self-regulation: Research, theory, and applications* (pp. 1-9). New York: Guilford.
- Vohs, K. D., Baumeister, R. F., & Loewenstein, G. (Eds.). (2007). *Do emotions help or hurt decision making?* New York: Russell Sage Foundation.
- Vohs, K. D., & Faber, R. J. (2007). Spent resources: Self-regulatory resource availability affects impulse buying. *Journal of Consumer Research, 33*, 537-547. doi: 10.1086/510228.
- Ward, A., & Mann, T. (2000). Don't mind if I do: Disinhibited eating under cognitive load. *Journal of Personality and Social Psychology, 78*, 753-763. doi: 10.1037/0022-3514.78.4.753.



- Wegner, D. M., Erber, R., & Zanakos, S. (1993). Ironic processes in the mental control of mood and mood-related thought. *Journal of Personality and Social Psychology, 65*, 1093-1104. doi: 10.1037/0022-3514.65.6.1093.
- Wentura, D., Rothermund, K., & Bak, P. (2000). Automatic vigilance: The attention-grabbing power of approach- and avoidance-related social information. *Journal of Personality and Social Psychology, 78*, 1024-1037. doi: 10.1037/0022-3514.78.6.1024.
- Wilson, T. D., Lindsey, S. R., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107*, 101-126. doi: 10.1037/0033-295X.107.1.101.
- Worchel, S., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. *Journal of Personality and Social Psychology, 32*, 906-914. doi: 10.1037/0022-3514.32.5.906.
- Xu, A. J., & Wyer, R. (2008). The comparative mind-set: From animal comparisons to increased purchase intentions. *Psychological Science, 19*, 859-864. doi: 10.1111/j.1467-9280.2008.02169.x.
- Young and Rubicam. (2006). All you need is envy. Retrieved May 20, 2008, from <http://emea.yr.com/envy.pdf>.
- Zajonc, R. B. (1965). Social facilitation. *Science, 149*, 269-274. doi: 10.1126/science.149.3681.269.
- Zajonc, R. B., & Sales, S. M. (1966). Social facilitation of dominant and subordinate responses. *Journal of Experimental Social Psychology, 2*, 160-168. doi: 10.1016/0022-1031(66)90077-1.

## Appendix

Stimuli used in the practice block of Experiment 4's approach-avoidance task:



Stimuli used in the target blocks of Experiment 4's approach-avoidance task:

