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Counterfactual Thoughts Distinguish Benign and Malicious Envy

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When people encounter others surpassing them in terms of an important quality, possession, or achievement, they often think about what might have happened differently so that they would have obtained a better outcome. Such upward counterfactual thoughts have been shown to contribute to the intensity of envy. We investigated whether specific counterfactual thoughts distinguish different forms of envy, namely benign envy, which entails upward motivation, and malicious envy—which entails hostility. A meta-analysis of 8 studies (1 preregistered, $N = 1{,}264$) of a first line of research supports that recalled episodes of benign versus malicious envy are characterized by more additive, self-focused counterfactuals or by more other-focused counterfactuals, respectively. Furthermore, a meta-analysis of 6 studies (1 preregistered, $N = 1{,}299$) of a second line of research supports that eliciting these counterfactuals promotes the corresponding form of envy. In line with functional accounts of counterfactual thinking and envy, the results highlight cognitive processes that underlie functionally diverging pathways of envious responding.

Keywords: counterfactual thinking, benign and malicious envy, social comparison, functions of emotions

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Sometimes, it is painfully easy to imagine that oneself could be better-off instead of another person. We can picture ourselves on the podium, ponder how having gotten that prestigious grant would feel, or wish not having been passed over for a promotion that was given to a colleague. Counterfactual thoughts about how "it could have been me" are not only painful, they fuel the intensity of envy toward the better-off (Van de Ven & Zeelenberg, 2015). Here, we investigate whether counterfactual thinking also explains the quality of envious responses.

Functional accounts of counterfactual thinking (Roese & Epstude, 2017) and of envy (Crusius & Lange, 2017; Van de Ven, Zeelenberg, & Pieters, 2009) posit that patterns of thoughts and forms of envy connect situational demands with behavioral intentions. Counterfactuals and envy may enable us to deal with adverse outcomes. Combining these theoretical perspectives, we argue that specific counterfactual thoughts that occur when people are worse-off characterize and accentuate diverging pathways of envious responding. Sometimes, via highlighting better actions that we could have taken, envious counterfactuals may foster self-improvement motivation. Sometimes, envious counterfactuals may also suggest that other people are to blame for our inferiority. Analyzing qualitative differences in how people mentally construe alternatives to events that caused threatening upward comparisons may thus provide insights into mechanisms of envy and its adaptive value.

Benign and Malicious Envy

Envy has been associated with a wide variety of diverging psychological and social phenomena. Sometimes, the outcomes reflect that envy can involve upward motivation: Envy may go along with increased effort and performance (Lange & Crusius, 2015; Schaubroeck & Lam, 2004; Van de Ven, Zeelenberg, & Pieters, 2011b) and drive consumer desire (Belk, 2011; Crusius & Mussweiler, 2012; Van de Ven, Zeelenberg, & Pieters, 2011a). It may even foster innovation (Barnett, 1953) and economic growth (Corneo & Jeanne, 2001). However, envy may also be a precursor to antisocial outcomes such as schadenfreude (Lange, Weidman, & Crusius, 2018; Smith et al., 1996; Van de Ven et al., 2015),

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We preregistered the design and analysis plan for Study 8 (https://aspredicted.org/c7k9c.pdf). We preregistered the design and analysis plan for Study 14 (https://aspredicted.org/3up5v.pdf), which was an exact replication of Study 12.

All research materials, raw data, and analysis scripts can be found in the supplementary profile of the Open Science Framework (https://osf.io/bb78z).

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hostility (Salovey & Rodin, 1984), the use of deception (Moran & Schweitzer, 2008), cheating (Gino & Pierce, 2009), and counterproductive work behavior (Cohen-Charash & Mueller, 2007).

Recent research supports that this diversity in envious responding reflects two qualitatively distinct forms of envy: benign and malicious envy (Falcon, 2015; Lange, Blatz, & Crusius, 2018; Lange, Weidman, & Crusius, 2018; Van de Ven et al., 2009; for a review and comparison to competing views, see Crusius, Gonzalez, Lange, & Cohen-Charash, 2020). In some ways, the two forms of envy closely resemble each other. Both are highly aversive emotions characterized by feelings of painful inferiority (Lange, Weidman, & Crusius, 2018; Van de Ven et al., 2009). Furthermore, they occur with comparable frequency (Van de Ven et al., 2009). In other ways, they are different. When people experience benign envy, they hold superior people in relatively positive regard, they strongly desire to attain their advantages as well, and they intend to invest more effort in improving themselves by moving upward and emulating the success of others. When experiencing malicious envy, people feel hostility toward superior others and are motivated to damage their superior position.

The qualitative differences between benign and malicious envy fit a functional account of envy. According to this account, the negative affect experienced in envy alerts people to comparative disadvantages and spurs them to put more effort in trying to repair self-evaluation and to ensure competitive success (Crusius & Lange, 2017; Hill & Buss, 2008; Lange, Blatz, & Crusius, 2018; Van de Ven et al., 2009). Benign and malicious envy may represent distinct pathways toward these goals depending on the perceived demands of the situation. Benign envy is more likely when people believe that their own future outcome is controllable (Brooks et al., 2019; Lange, Crusius, & Hagemeyer, 2016; Van de Ven et al., 2009; Van de Ven, Zeelenberg, & Pieters, 2012). In such situations, damaged self-esteem may be best repaired by intensifying the effort to move upward (Crusius & Lange, 2017; Meier & Schäfer, 2018; Smallets, Streamer, Kondrak, & Seery, 2016). This reasoning is in line with the findings that upward comparison standards inspire when their outcome is perceived to be attainable (Lockwood & Kunda, 1997), that benign envy focusses attention on means for goal attainment (Crusius & Lange, 2014), that it is associated with upward risk taking (Kwon, Han, & Nam, 2017), and higher performance (e.g., Lange & Crusius, 2015; Sawada & Fujii, 2016; Van de Ven et al., 2011b).

In contrast, malicious envy occurs in situations in which people perceive the outcome of the envied person as undeserved (Lange et al., 2016; Van de Ven et al., 2009, 2012). In such situations, self-esteem may be protected best by pulling the other person down by denigrating superior persons and their fortunes or by taking action to reduce their status (Crusius & Lange, 2017; Van de Ven et al., 2009). This reasoning is supported by evidence supporting that malicious envy contains hostile feelings and goals (Van de Ven et al., 2009), shifts attention toward the other person but not to means to attain his or her superior fortune (Crusius & Lange, 2014), can cause a devaluation of this fortune (Van de Ven et al., 2011a), and that it predicts harming intentions and behavior (e.g., Braun, Aydin, Frey, & Peus, 2015; Lange & Crusius, 2015; Montal-Rosenberg & Moran, 2020; Moyal, Motsenok, & Ritov, 2020).

Taken together, benign and malicious envy can be interpreted as emotional responses that fulfill diverging functions when being worse-off in important comparison domains. In line with these functional values, specific patterns of counterfactual thinking might connect envy-eliciting situations with their emotional outcomes.

Patterns of Counterfactual Thinking: Direction, Structure, and Focus

When people engage in an upward social comparison with another person, they often imagine how things might have turned out differently: "If only I had studied more, I would have received a good grade, too"; "If only she hadn't been there first." Such counterfactual thoughts—comparisons of past events with imagined alternatives (Byrne, 2016; Roese & Epstude, 2017)—are theorized to be a core feature of envy (Ben-Ze'ev, 1992; Coricelli & Rustichini, 2010; Elster, 1999; Frijda, 2007; Kahneman, 1999; Larrick, 1993; Smith & Kim, 2007; Van de Ven et al., 2009). According to this perspective, envy is a quintessentially counterfactual emotion because it rests on upward counterfactual comparisons of reality with a more fortunate alternative. Consequently, upward social comparisons should only sting when such an alternative construction of reality is easy to conceive.

This notion may at least partly explain that envy is particularly likely if people compare with highly similar others (e.g., Salovey & Rodin, 1984; Schaubroeck & Lam, 2004). Presumably, in such comparisons, the thought "it could have been me" is especially plausible and readily available (Smith & Kim, 2007). Indeed, when people recall an episode of envy, they can easily imagine that the situation could have turned out differently (Teigen, 1997). Furthermore, counterfactuals strongly influence affect when they involve social comparisons (Morewedge, Zhu, & Buechel, 2019). Direct evidence on the role of counterfactual thinking in envy stems from research by Van de Ven and Zeelenberg (2015) in which the amount of counterfactual thinking predicted the intensity of envy. Furthermore, manipulating variables that increased the amount of counterfactual thinking also led to a corresponding increase in the intensity of envy. This evidence suggests that salient counterfactuals fuel envy.

Here, we argue that counterfactuals contribute not only to the intensity of envy but can also explain the quality of envy. Research on counterfactual thinking has demonstrated that negative experiences trigger spontaneous counterfactual thoughts (e.g., Davis, Lehman, Wortman, Silver, & Thompson, 1995; Markman, Gavanski, Sherman, & McMullen, 1993) and that these can affect the quality of the ensuing emotional reactions (Mandel, 2003; Mandel & Dhami, 2005; Niedenthal, Tangney, & Gavanski, 1994; Zeelenberg et al., 1998). For example, when thinking about an immoral behavior that one has committed, counterfactuals about stable characteristics of the self increase feelings of shame, whereas counterfactuals about the behavior itself increase feelings of guilt (Niedenthal et al., 1994). Similarly, when thinking about negative events, counterfactuals about own actions increase regret, whereas counterfactuals about aspects of the situation increase disappointment (Zeelenberg et al., 1998). In such contexts, specific counterfactuals accentuate emotional responses by making certain emotional appraisals more salient (Niedenthal et al., 1994; Zeelenberg

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et al., 1998). The specific counterfactuals evoked in envy-eliciting situations may also contribute to the course of episodes of envy.

The counterfactuals in benign versus malicious envy might be understood by applying theorizing on the functions of such thoughts. According to the functional theory of counterfactual thinking (e.g., Roese & Epstude, 2017), counterfactuals regulate behavior by guiding intentions in response to unmet goals. By highlighting links between specific antecedents and desired outcomes (e.g., "If I had trained harder, I would have been able to finish the marathon"), counterfactuals contribute to goal pursuit because they activate the corresponding behavioral intentions aimed at achieving the goal (e.g., "I will train harder from now on"). In line with these notions, counterfactuals can lead to increased effort and performance (Roese & Epstude, 2017).

This upward motivating character of counterfactual thinking is bound to certain counterfactuals. Epstude and Roese (2008) proposed that the content of counterfactual thought can be organized by three important distinctions. The first concerns their direction, which can be upward or downward. Performance gains are tied to upward counterfactuals, that is, those that compare reality with a better alternative (e.g., "I could have finished the marathon"), rather than downward counterfactuals (e.g., "It could have been worse").

The second distinction concerns the counterfactuals' structure, which can be additive or subtractive. Performance gains are particularly likely (Roese, 1994) if upward counterfactuals are additive rather than subtractive, that is, if they alter reality by adding a successful antecedent action (e.g., "If I had trained harder") rather than by subtracting an antecedent action (e.g., "If only I had not let myself be distracted"). Presumably, such upward additive counterfactuals contain useful information for improvement as they focus on the generation of actions missed or not considered in the past (Roese, 1994; Roese & Olson, 1993a, 1993b). Furthermore, upward additive counterfactuals should be particularly likely when people believe that they have the opportunity for gains by future action (Epstude & Roese, 2008; Roese, Hur, & Pennington, 1999).

The third important distinction concerns the focus of counterfactual thinking, that is whether counterfactual thoughts are about actions of the self or those of other people. Counterfactuals predominantly focus on controllable actions of the self. However, they can also focus on the actions of others, particularly if people believe that others initiated an event (Roese, Smallman, & Epstude, 2017). Even though less is known about the functionality of other-related counterfactuals, it seems clear that they are less useful for upward behavior regulation than self-focused counterfactuals (Roese & Epstude, 2017) and may often occur when we blame other people for our poor lot (e.g., Branscombe, Owen, Garstka, & Coleman, 1996; Davis et al., 1995).

Although additive and self-related upward counterfactuals seem to prepare the individual to improve performance, this should not imply that subtractive and other-related upward counterfactuals cannot be functional. Besides their preparatory value, upward counterfactuals can provide excuses for poor performance and, by doing so, protect self-esteem (McCrea, 2008). Such effects seem to occur when individuals pursue a self-protection motive. In contrast, when pursuing a self-improvement motive, upward counterfactuals may lead to performance benefits (Tyser, McCrea, & Knüpfer, 2012). Thus, the differing content of counterfactual thoughts can reflect and contribute to different self-regulatory goals.

Counterfactuals in Benign and Malicious Envy

Combining these literatures, we hypothesize that the content of the counterfactuals that underlie benign and malicious envy differ. Enviers are in a situation that forces upward counterfactual thoughts upon them. In the case of envy, such upward counterfactuals remove or even reverse the envier's relative disadvantage, improving the relative position of the self compared with the envied other. How might these upward counterfactuals differ in benign versus malicious envy in terms of their structure and focus? From a functional perspective, in situations in which enviers perceive their failure and future outcomes to be (at least in principle) controllable, these counterfactuals should be additive, and they should concern the envier's own actions. Therefore, in such situations, an upward motivating episode of benign envy should be more likely. In other words, benign envy's aim to level oneself up may reflect upward, additive counterfactuals focused at the self in benign envy situations. In them, such counterfactuals may prove useful in learning for the future and may activate efforts to enhance performance.

In contrast, we predict that malicious envy is characterized by counterfactuals about other people instead of past actions of the self. In malicious envy, people see the advantage of the other person to be undeserved. Thus, counterfactuals that are upward but mutate aspects outside their own responsibility should be more prevalent. Presumably, these counterfactuals may well be additive (e.g., "if only he had been given a more difficult task"), as well as subtractive (e.g., "if only she had not been picked first") but share the implication that self-improvement by own action is unlikely. These envious upward counterfactuals also alter the relative outcomes of the self and the other, but they may stress a worse alternative to reality for the envied person.[1]

Reflecting malicious envy's aim to protect self-esteem by pulling the other person down (Van de Ven et al., 2009), upward counterfactuals focused at other persons' actions may deliver reasons why actions of the self were not the driving force behind the unflattering comparison outcome. Thus, in malicious envy situations, other-focused (upward) counterfactuals would be most functional in protecting envier's threatened self-esteem and contribute to actions that level the other down, but they should not contribute to upward intentions. Thus, while being different in content, both counterfactual patterns should have functional value when considering the respective goals of the envier. In summary, we predict that benign envy is more strongly related to additive counterfactuals that regard past actions of the self, whereas in malicious envy, other-focused counterfactuals should be relatively more prevalent than in benign envy.

We conducted two lines of research that we report in their entirety, that is, all studies we conducted on this topic, including preliminary studies. We report the findings individually and via

[1] Note that in the terminology of the counterfactual thinking literature, such counterfactuals are nevertheless upward counterfactuals (for the self). In contrast, downward counterfactuals are those that simulate an even inferior reality for the self and, by this contrast, elicit positive affect ("It could have been worse [for me]!"; Roese & Epstude, 2017).

meta-analyses. For the first studies of both lines of research, we determined sample size by rule of thumb, taking previous research on the relationship of counterfactuals and specific emotions as example. We based sample size considerations of the later studies on our findings and the goal to achieve 80% power for small to medium effects.

Research Line 1: Are Benign and Malicious Envy Characterized by Different Counterfactuals?

To investigate whether distinct counterfactual thoughts characterize benign and malicious envy, we asked participants to recall recent episodes of benign versus malicious envy and assessed their counterfactual thoughts elicited in these episodes. Eight studies investigated envious counterfactuals in this way. We predicted that people generate more upward, additive, self-focused counterfactual thoughts, but less upward, other-focused counterfactuals, when they recall benign as compared to malicious envy. Moreover, we predicted that the respective kinds of counterfactual thoughts should also predict the self-reported ratings of the respective envy forms. In most studies, we restricted participants to generate upward counterfactual thoughts, because we reasoned that downward counterfactuals would not play a large role in envy. We verified this reasoning in two studies in which participants were free to generate all kinds of counterfactual thoughts. The method of eliciting envy via recall has the advantage of sampling naturally occurring emotional episodes in the breadth of their variation. A disadvantage is that the retrospective design cannot support our reasoning that counterfactuals can accentuate the experience of envy. We investigated this causal order in Research Line 2.

Method

Participants. Table 1 presents demographic information about all samples.[2]

Materials and procedure. In all eight studies, the form of envy was the independent variable and participants' counterfactual thoughts were the dependent variable. The exact procedures of how we elicited episodes of benign versus malicious envy and how we assessed counterfactual thinking differed between the studies. See Table 1 for an overview of the specific methodology per study and the online supplemental material for more detailed method descriptions. Some studies include additional measures relevant for different research questions.

In all studies, participants engaged in the relived emotions task (Ekman, Levenson, & Friesen, 1983; Roseman, Wiest, & Swartz, 1994). Participants recalled a situation in which they felt envy. They had to close their eyes and try to reexperience the situation as authentically as possible by thinking about their feelings. Participants then described the situation in a small textbox as if they are talking to a good friend. In Studies 1 and 4, they recalled a situation in which they experienced envy in general, that is, we did not specify whether they should recall an episode of benign or malicious envy. For these two studies, we intended to classify the episodes using cluster analyses (Van de Ven et al., 2009). In the other studies, participants either recalled a benign or a malicious envy situation. Specifically, in Studies 2, 3, and 7, we relied on the German terms that refer to benign (*beneiden*) and malicious envy (*missgönnen*; Crusius & Lange, 2014). In Studies 5, 6, and 8, we asked participants to recall a situation in which they thought the envied person's advantage was either deserved or undeserved (Lange & Crusius, 2015; Salerno, Laran, & Janiszewski, 2019).

Subsequently, we assessed counterfactual thoughts evoked in the emotional situations. In Studies 1, 3, 4, and 6, we told participants that people often think "what if" after experiences like the one they described. Additional instructions varied. In Studies 1 and 4, participants' task was then to list all things they could think of that, had they been different, would have changed the situation. This can lead to upward as well as downward counterfactual thoughts. In Study 3, participants' task was to generate counterfactual thoughts in the form of "If . . ., then . . ." for how the situation "could have been better," thus limiting their answers to upward counterfactual thoughts. In Study 6, we described that people may imagine how they themselves or other people have done something they actually have not done or not have done something they actually did. Participants' task was then to generate three counterfactuals by completing the space in three sentences of the form "If . . ., then the past would have been better." These instructions elicit upward counterfactuals but emphasize variation in structure and focus.

In the other studies, measurement of counterfactual thoughts was different. In Study 2, we investigated whether the form of envy affects counterfactual thoughts in an unrelated scenario. Specifically, participants read the story of Mr. Müller, who relies on a wheelchair after a car accident. Participants' task was to take Mr. Müller's perspective when he was recalling the last hours of the event and to write counterfactual thoughts in the form of "If . . ., then the accident would not have happened." Mr. Müller's description of the event hinted at certain counterfactual thoughts, two for each cell when crossing Structure (additive vs. subtractive) and Focus (self vs. other). For instance, Mr. Müller took an unusual route home, which could elicit a self-related, subtractive counterfactual such as "If only I had not taken the unusual route home, the accident would not have happened."

In Studies 5, 7, and 8, participants rated their inclination for counterfactual thoughts ("If I imagine a better past, I would wish that. . .") on four items measuring additive, self-focused (". . .I would have done additional things that I did not do"), subtractive, self-focused (". . .I would NOT have done some things that I did"),

[2] We a priori decided to exclude everyone who did not write about envy and who did not write meaningful counterfactual thoughts (in studies in which participants formulated counterfactual thoughts). This led to the exclusion of 16 participants in Study 1, five participants in Study 2, eight participants in Study 3, 14 participants in Study 4, seven participants in Study 5, 12 participants in Study 6, 13 participants in Study 7, and 16 participants in Study 8. Because counterfactual thoughts rely heavily on language, we additionally decided a priori to exclude all non-native speakers. This led to the additional exclusion of one participant in Study 1, three participants in Study 2, 15 participants in Study 3, five participants in Study 4, six participants in Study 5, six participants in Study 6, 25 participants in Study 7, and nine participants in Study 8. Note that in the preregistration of Study 8, we forgot to mention that we also exclude non-native speakers. Repeating the analyses with non-native speakers included led to almost identical results. Finally, from Study 4 onwards, we also included a question in which participants could indicate that we should not use their data (Meade & Craig, 2012). This led to the additional exclusion of two participants in Study 4, one participant in Study 5, five participants in Study 6, 15 participants in Study 7, and three participants in Study 8.

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Table 1
Research Line 1: Overview of Operationalizations and Sample Characteristics

	Operationalization			Sample characteristic			
	Independent variables: Benign vs. Malicious Envy		Main dependent variables: Structure × Focus of Counterfactuals				
Study	Envy condition	Envy measure		Source	*n*	% Male	M_{age} (*SD*), Range
1	Recall of envy episode; classification via cluster analysis (not successful)	Items from Van de Ven, Zeelenberg, and Pieters (2009; Study 3)	Coded free responses about what could have been different in episode	United States, crowd sourcing (MTurk)	83	65	30.7 (12.5), 18–65
2	Recall of benign vs. malicious envy episodes elicited via German emotion terms	Scales from Crusius and Lange (2014)	Coded free responses about upward counterfactuals in unrelated scenario	Germany, lab, undergraduates	89	22	24.8 (4.1), 17–38
3	Recall of benign vs. malicious envy episodes elicited via German emotion terms	Scales from Crusius and Lange (2014)	Coded free responses about upward counterfactuals in episode	Germany, lab, undergraduates	128	34	22.6 (3.5), 15–35
4	Recall of envy episode; classification via cluster analysis	Items from Van de Ven et al. (2009; Study 3)	Coded free responses about what could have been different in episode	United States, crowd sourcing (MTurk)	110	51	34.4 (12.4), 18–69
5	Recall of benign vs. malicious envy episodes by manipulating envied other's deservingness	Scales from Crusius and Lange (2014)	Self-rating of counterfactuals on one item per design combination	United States, crowd sourcing (MTurk)	88	36	36.6 (12.8), 18–66
6	Recall of benign vs. malicious envy episodes by manipulating envied other's deservingness	Scales from Crusius and Lange (2014)	Coded free responses about what could have been different in episode	United States, crowd sourcing (MTurk)	191	58	33.0 (11.6), 18–74
7	Recall of benign vs. malicious envy episodes elicited via German emotion terms	Scales from Crusius and Lange (2014)	Self-rating of counterfactuals on one item per design combination	Germany, lab, undergraduates, and online participant pool	199	20	25.0 (6.1), 18–64
8	Recall of benign vs. malicious envy episodes by manipulating envied other's deservingness	PaDE Scale (Lange, Weidman, & Crusius, 2018)	Self-rating of counterfactuals on one item per design combination	United States, crowd sourcing (MTurk)	376	48	36.2 (11.4), 18–75

Note. MTurk = Amazon Mechanical Turk; PaDE = Pain-Driven Dual Envy Theory.

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additive, other-focused (". . . Other people would have done additional things that they did not do"), and subtractive, other-focused thoughts (". . . Other people would NOT have done some things they did") using a scale from 1 (*does not apply at all*) to 7 (*applies very much*).

In Studies 1, 2, 3, 4, and 6, two raters coded participants' counterfactuals. One rater was always the second author. Student assistants served as the other rater. Both were blind to condition and the assistant was blind to the hypotheses. The raters classified each counterfactual using a scheme crossing Direction (upward vs. downward), Structure (additive vs. subtractive), and Focus (self vs. other). In Studies 2, 3, and 6, the instructions prevented downward counterfactuals. Raters therefore classified them only according to Structure and Focus. In all studies, we averaged across raters. The hypothesis tests investigated the number of (upward) additive, self-focused as well as (upward) other-focused counterfactual thoughts. We calculated rater agreement for each dimension of the classification scheme separately. In Study 1, agreement was 83% for Direction, 84% for Structure, and 82% for Focus. In Study 2, agreement was 97% for Structure and 97% for Focus. In Study 3, agreement was 95% for Structure and 95% for Focus. In Study 4, agreement was 93% for Direction, 92% for Structure, and 93% for Focus. In Study 6, agreement was 96% for Structure and 99% for Focus.

Finally, participants responded to items measuring envy. In Studies 1 and 4, these items were also intended to classify the episodes of envy as benign versus malicious. In Study 1, we took eight items from Van de Ven et al. (2009; Study 3). As in this previous work, we used these items in a *k*-means cluster analysis with pairwise deletion of missing values in SPSS (Version 24; IBM Corp., 2016). This analysis produced two clusters, but they did not map onto benign and malicious envy. Therefore, we could not use the form of envy as an independent variable in Study 1. For the correlational test of our hypotheses, we averaged the four items that showed higher values for benign envy in the original study by Van de Ven et al. ("It felt pleasant," "I felt inspired by the person whom I envied," "I tried harder to achieve my goals," "I complimented the other for his or her success") to a benign envy score ($\alpha = .69$) and the four items that showed higher values for malicious envy ("I felt cold toward the person whom I envied," "It felt frustrating," "I hoped that the person whom I envied would fail something," "I complained to someone else about the person whom I envied") to a malicious envy score ($\alpha = .75$). In Study 4, we excluded one of these items ("It felt frustrating") because it theoretically distinguishes less between benign and malicious envy (Crusius & Lange, 2014; Falcon, 2015). With the remaining seven items, the cluster analysis indeed produced two interpretable clusters. We averaged the remaining items as in Study 1 to benign ($\alpha = .70$) and malicious ($\alpha = .72$) envy scores.

In Studies 2, 3, 5, 6, and 7, we used other previously validated items (Crusius & Lange, 2014; for English-speaking samples, we excluded two untranslatable items) to measure benign envy (αs = .70–.81), malicious envy (αs = .84–.90), intensity of negative affect (αs = .60–.80), and deservingness (αs = .75–.88). In Study 8, we used benign envy ($\alpha = .67$), malicious envy ($\alpha = .84$), as well as pain ($\alpha = .73$) items from the Pain-Driven Dual Envy Theory (PaDE; Lange, Weidman, & Crusius, 2018) complementing them with the deservingness scale from the other studies ($\alpha = .84$). In Studies 4 to 8, the order was reversed such that participants worked on the envy questions before the counterfactual thoughts.

Results

Table 2 presents the descriptive results and test statistics comparing the benign and malicious envy conditions on the manipulation checks. The table excludes Study 1, as the cluster analysis did not distinguish between benign and malicious envy. All studies that differentiate between benign and malicious envy episodes did so successfully. Specifically, the benign envy condition led to higher ratings than the malicious envy condition for the benign envy scale and the pattern reversed for the malicious envy scale. If deservingness and valence were assessed, the benign envy condition led to higher ratings than the malicious envy condition for deservingness and there was no difference between the conditions for the intensity of negative affect and pain.

We first verified that envy situations indeed involved primarily upward counterfactual thoughts. We compared the number of upward and downward counterfactual thoughts in the two studies in which we allowed participants to generate downward counterfactual thoughts, namely Studies 1 and 4. In Study 1, participants generated more upward ($M = 1.72$, $SD = 0.89$) than downward counterfactual thoughts ($M = 0.08$, $SD = 0.42$), $t(82) = 14.16$, $p < .001$. Also in Study 4, participants generated more upward ($M = 1.63$, $SD = 0.88$) than downward counterfactual thoughts ($M = 0.01$, $SD = 0.08$), $t(109) = 19.11$, $p < .001$. Participants generated so few downward counterfactuals that we decided to focus on upward counterfactuals.

Table 3 presents descriptive statistics and tests of the predicted condition differences of counterfactual thoughts in benign versus malicious envy. All descriptive statistics are available in the online supplemental material (see Table S1). As the main test of our hypotheses, we conducted two meta-analyses. The first meta-analysis integrated results for the comparison of the benign and malicious envy conditions regarding (upward) additive, self-focused counterfactual thoughts and (upward) other-focused counterfactual thoughts. We analyzed the data in R (Version 3.6.1; R Core Team, 2019), imported the data with the package *rio* (Version 0.5.16; Chan, Chan, Leeper, & Becker, 2018), and checked descriptive statistics with the package *psych* (Revelle, 2020). The main analysis proceeded in two steps. First, we used the package *bootES* (Kirby & Gerlanc, 2013; Version 1.2) to determine Cohen's *d* for both effects in each study. As we had no manipulation of benign and malicious envy in Study 1, this study was excluded from the first meta-analysis. Second, we conducted a multiple-endpoint, random-effects meta-analysis with maximum likelihood estimation using the package *metafor* (Version 2.1.0; Viechtbauer, 2010). Specifically, we analyzed the effect of envy on both kinds of counterfactual thoughts simultaneously. Because we had two effects from each study, the effects are dependent. To control this dependence, we conducted a multilevel model with effects nested in studies and calculated the covariance of both effects with formulas taken from Gleser and Olkin (2009).

Figure 1 shows the forest plot of the first meta-analysis. As predicted, the benign envy condition led to more (upward) additive, self-focused counterfactuals ($d = 0.230$, $SE = 0.052$, $p < .001$, 95% CI [0.128, 0.333]), but less (upward) other-focused counterfactuals ($d = -0.242$, $SE = 0.052$, $p < .001$, 95% CI [−0.345, −0.140]) than the malicious envy condition.

Table 2
Research Line 1: Manipulation Check for Studies 2 to 8

Measure	M_{Benign} (*SD*)	$M_{Malicious}$ (*SD*)	Univariate ANOVA
Study 2 ($n_{Benign} = 45$, $n_{Malicious} = 44$)			
Benign envy	4.90 (1.03)	4.38 (1.12)	$F(1, 87) = 5.20$, $p = .02$, $\eta_p^2 = .06$
Malicious envy	2.38 (1.14)	3.70 (1.10)	$F(1, 87) = 30.84$, $p < .001$, $\eta_p^2 = .26$
Intensity of negative affect	4.77 (1.55)	5.14 (1.40)	$F(1, 87) = 1.43$, $p = .24$, $\eta_p^2 = .02$
Deservingness	4.37 (1.60)	2.79 (1.31)	$F(1, 87) = 26.02$, $p < .001$, $\eta_p^2 = .23$
Study 3 ($n_{Benign} = 60$, $n_{Malicious} = 68$)			
Benign envy	4.92 (1.04)	4.31 (1.19)	$F(1, 126) = 9.33$, $p = .003$, $\eta_p^2 = .07$
Malicious envy	2.71 (1.39)	3.84 (1.19)	$F(1, 126) = 24.36$, $p < .001$, $\eta_p^2 = .16$
Intensity of negative affect	5.12 (1.37)	5.33 (1.32)	$F(1, 126) = 0.79$, $p = .38$, $\eta_p^2 = .01$
Deservingness	4.15 (1.97)	2.58 (1.35)	$F(1, 126) = 28.06$, $p < .001$, $\eta_p^2 = .18$
Study 4 (two clusters; $n_{Benign} = 57$, $n_{Malicious} = 53$)			
Benign envy	4.47 (1.00)	2.80 (1.03)	$F(1, 108) = 74.32$, $p < .001$, $\eta_p^2 = .41$
Malicious envy	1.87 (0.92)	4.44 (1.26)	$F(1, 108) = 147.02$, $p < .001$, $\eta_p^2 = .58$
Study 5 ($n_{Benign} = 45$, $n_{Malicious} = 43$)			
Benign envy	5.31 (1.03)	4.05 (1.30)	$F(1, 86) = 25.65$, $p < .001$, $\eta_p^2 = .23$
Malicious envy	2.64 (1.48)	3.87 (1.49)	$F(1, 86) = 15.01$, $p < .001$, $\eta_p^2 = .15$
Intensity of negative affect	4.84 (1.29)	5.03 (1.59)	$F(1, 86) = 0.37$, $p = .55$, $\eta_p^2 = .004$
Deservingness	5.16 (1.61)	2.55 (1.41)	$F(1, 86) = 65.16$, $p < .001$, $\eta_p^2 = .43$
Study 6 ($n_{Benign} = 100$, $n_{Malicious} = 91$)			
Benign envy	5.38 (0.90)	4.36 (1.15)	$F(1, 189) = 46.85$, $p < .001$, $\eta_p^2 = .20$
Malicious envy	2.42 (1.54)	3.65 (1.55)	$F(1, 189) = 30.13$, $p < .001$, $\eta_p^2 = .14$
Intensity of negative affect	4.91 (1.64)	5.21 (1.54)	$F(1, 189) = 1.68$, $p = .20$, $\eta_p^2 = .01$
Deservingness	5.06 (1.88)	2.54 (1.38)	$F(1, 189) = 109.77$, $p < .001$, $\eta_p^2 = .37$
Study 7 ($n_{Benign} = 99$, $n_{Malicious} = 100$)			
Benign envy	4.81 (1.08)	3.92 (1.32)	$F(1, 197) = 26.83$, $p < .001$, $\eta_p^2 = .12$
Malicious envy	2.20 (1.27)	3.11 (1.31)	$F(1, 197) = 24.42$, $p < .001$, $\eta_p^2 = .11$
Intensity of negative affect	4.85 (1.56)	4.75 (1.57)	$F(1, 197) = 0.20$, $p = .65$, $\eta_p^2 = .001$
Deservingness	4.31 (1.74)	2.86 (1.48)	$F(1, 197) = 40.03$, $p < .001$, $\eta_p^2 = .17$
Study 8 ($n_{Benign} = 190$, $n_{Malicious} = 186$)			
Benign envy	4.03 (1.42)	3.42 (1.29)	$F(1, 374) = 18.77$, $p < .001$, $\eta_p^2 = .05$
Malicious envy	2.49 (1.50)	3.83 (1.68)	$F(1, 374) = 67.07$, $p < .001$, $\eta_p^2 = .15$
Intensity of negative affect	3.57 (1.60)	3.72 (1.63)	$F(1, 374) = 0.81$, $p = .37$, $\eta_p^2 = .002$
Deservingness	4.94 (1.77)	2.79 (1.46)	$F(1, 374) = 164.85$, $p < .001$, $\eta_p^2 = .31$

Note. Answers were given on a scale ranging from 1 (*does not apply at all* or *not at all*) to 7 (*applies very much* or *very much*). ANOVA = analysis of variance.

The second meta-analysis integrated results of the correlational tests, linking the benign and malicious envy scales to the respective counterfactual thoughts, for all studies. We transformed the correlation coefficients to Fisher's *Z* and used the same analytical strategy as for the first meta-analysis, calculating the covariance with a formula taken from Steiger (1980).

Figure 2 presents the forest plot of the second meta-analysis. In line with our hypotheses, the benign envy scale correlated positively with (upward) additive, self-focused counterfactual thoughts ($Z = 0.171$, $SE = 0.046$, $p < .001$, 95% CI [0.081, 0.260]), and the malicious envy scale correlated positively with (upward) other-focused counterfactual thoughts ($Z = 0.186$, $SE = 0.035$, $p < .001$, 95% CI [0.117, 0.254]).

Discussion

The studies provide converging, meta-analytic support for the prediction that benign and malicious envy are characterized by different patterns of counterfactual thinking. When people recalled an episode of benign envy, they reported more upward counterfactuals that were additive and focused on the self than when recalling an episode of malicious envy. Additionally, episodes of malicious envy were characterized more strongly by counterfactuals about other people than episodes of benign envy. Correlational analyses also supported our predictions: Higher benign envy was associated with more (upward) additive, self-focused counterfactuals. Higher malicious envy was associated with more (upward) other-focused counterfactuals.

Research Line 2: The Effect of Counterfactual Thoughts on Envy

The previous line of research suggests that benign and malicious envy are characterized by different counterfactuals. Next, we investigated whether these counterfactuals are part of the appraisals that differentiate whether an episode of envy evolves as benign or malicious. Activating certain counterfactuals should then alter envious

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Table 3
Research Line 1: Counterfactual Thoughts Elicited in Benign Versus Malicious Envy Conditions for Studies 2 to 8

Counterfactual thought	M_{Benign} (*SD*)	$M_{Malicious}$ (*SD*)	*t*[a]
	Study 2 ($n_{Benign} = 45$, $n_{Malicious} = 44$)		
Additive, self-focused[b]	2.61 (1.39)	2.31 (1.39)	$t(87) = 1.04$, $p = .30$
Other-focused[b]	1.04 (0.99)	0.81 (0.90)	$t(87) = 1.18$, $p = .24$
	Study 3 ($n_{Benign} = 60$, $n_{Malicious} = 68$)		
Additive, self-focused[b]	1.38 (1.51)	1.19 (0.94)	$t(126) = 0.87$, $p = .38$
Other-focused[b]	0.69 (0.83)	1.08 (1.15)	$t(126) = -2.17$, $p = .03$
	Study 4 (two clusters; $n_{Benign} = 53$, $n_{Malicious} = 57$)		
Additive, self-focused[b]	1.04 (0.76)	1.13 (0.88)	$t(108) = -0.59$, $p = .55$
Other-focused[b]	0.17 (0.43)	0.29 (0.56)	$t(108) = -1.26$, $p = .21$
	Study 5 ($n_{Benign} = 45$, $n_{Malicious} = 43$)		
Additive, self-focused[c]	5.44 (1.69)	4.65 (2.20)	$t(86) = 1.90$, $p = .06$
Other-focused[c]	4.03 (2.14)	4.88 (1.80)	$t(86) = -2.01$, $p = .046$
	Study 6 ($n_{Benign} = 100$, $n_{Malicious} = 91$)		
Additive, self-focused[d]	2.15 (0.98)	1.77 (1.08)	$t(189) = 2.56$, $p = .01$
Other-focused[d]	0.44 (0.85)	0.80 (1.09)	$t(189) = -2.54$, $p = .01$
	Study 7 ($n_{Benign} = 99$, $n_{Malicious} = 100$)		
Additive, self-focused[c]	5.04 (1.83)	4.49 (1.90)	$t(197) = 2.08$, $p = .04$
Other-focused[c]	4.20 (1.89)	4.66 (1.78)	$t(197) = -1.76$, $p = .08$
	Study 8 ($n_{Benign} = 190$, $n_{Malicious} = 186$)		
Additive, self-focused[c]	5.17 (1.81)	4.67 (2.09)	$t(374) = 2.49$, $p = .01$
Other-focused[c]	3.87 (1.66)	4.17 (1.65)	$t(374) = -1.78$, $p = .08$

[a] Condition was coded benign (−1) and malicious (1). [b] Freely generated counterfactual thoughts. [c] Answers were given on a scale from 1 (*does not apply at all*) to 7 (*applies very much*). [d] Three generated counterfactual thoughts.

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responding. To investigate this possibility, we manipulated counterfactual thinking in six studies and assessed whether this causes people to experience more benign versus malicious envy. In Studies 9 to 11, we manipulated counterfactuals between participants, whereas in Studies 12 to 14, we manipulated counterfactuals within participants. Across all studies, we predicted that (upward) additive, self-focused counterfactuals increase benign envy, whereas (upward) other-focused counterfactuals increase malicious envy.

Method

Participants. Table 4 presents demographic information about all samples.[3]

Materials and procedure. In all six studies, we manipulated participants' counterfactual thoughts and measured envy. The exact procedures partly differed between the studies. See Table 4 for an overview of the specific methodology per study and the online supplemental material for more detailed method descriptions. Some studies were part of a larger data collection effort and thus included additional measures relevant for different research questions.

Studies 9 to 11 manipulated counterfactual thoughts between participants. In Study 9, participants imagined that a gender-matched person, Tina/Timo, outperformed them in an important exam. Because of this, they think back about what happened during the lectures and the study period. In these thoughts, we hinted at three counterfactuals each when crossing Structure and Focus. For instance, there were rumors that Tina/Timo is the lecturer's favorite in the class, which could elicit a subtractive, other-focused counterfactual such as "If Tina/Timo would not have been the lecturer's favorite, s/he would not have outperformed me." Participants' task was then to generate three counterfactual thoughts about what should have been different such that

[3] Because counterfactual thoughts rely heavily on language, we decided a priori to exclude all non-native speakers. This led to the exclusion of 19 participants in Study 9, 13 participants in Study 10, 11 participants in Study 11, two participants in Study 13, and 7 participants in Study 14. Moreover, we excluded participants who indicated that we should not use their data (Meade & Craig, 2012). This led to the additional exclusion of four participants in Study 9, one participant in Study 10, five participants in Study 11, one participant in Study 12, and 13 participants in Study 13. Furthermore, when we had a separate comprehension check of the manipulation of counterfactual thoughts in the studies with between-subjects manipulations, we a priori decided to exclude everyone who failed the comprehension check. This led to the additional exclusion of 14 participants in Study 10, and 13 participants in Study 11. Also, as participants in Study 11 recalled an envy situation, we again a priori decided to exclude everyone who did not write about envy. This led to the additional exclusion of 22 participants. Finally, we excluded everyone who wrote nonsensical responses for counterfactual thoughts. This led to the additional exclusion of two participants in Study 12, 20 participants in Study 13, and six participants in Study 14.

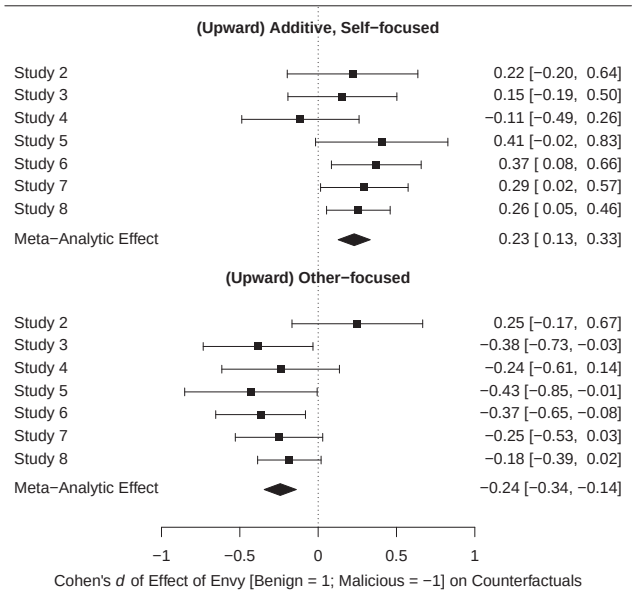

Figure 1. Forest plot for the meta-analysis of the experimental condition differences in counterfactual thoughts elicited in episodes of benign versus malicious envy (Research Line 1). The top panel shows the effect of more (upward) additive, self-focused counterfactuals in benign relative to malicious envy. The bottom panel shows the effect of more (upward) other-focused counterfactuals in malicious relative to benign envy.

the situation would have been better. Depending on the condition, participants generated additive, self-focused (n = 46), subtractive, self-focused (n = 45), additive, other-focused (n = 50), or subtractive, other-focused (n = 39) counterfactuals.

The design of Study 10 was similar. As many participants in Study 9 struggled formulating the intended counterfactuals, we now let participants practice generating them with unrelated statements. We excluded those with incorrect answers to these practice questions (see Footnote 3). Participants then imagined being a high-potential employee at a company called *BetterFuture* and that they compete for a promotion against a gender-matched person Hillary/Joe. Eventually, Hillary/Joe gets the promotion about which s/he is very proud, frustrating the participant. Participants imagined thinking back to the time before the promotion and we again hinted at three counterfactuals for each combination when crossing Structure and Focus. Participants then generated three additive, self-focused (n = 97), subtractive, self-focused (n = 88), additive, other-focused (n = 98), or subtractive, other-focused (n = 85) counterfactuals.

In Study 11, we again asked participants to practice formulating counterfactual thoughts according to their condition and excluded everyone who failed to do so. Subsequently, participants recalled an envy situation using the relived emotion task as in the studies on the effect of envy on counterfactual thoughts. Participants' task was then to formulate three additive, self-focused (n = 93), subtractive, self-focused (n = 86), additive, other-focused (n = 93), or subtractive, other-focused (n = 81) counterfactuals related to this situation.

Finally, participants rated their envy. In Studies 9 and 11, they rated the same benign (αs = .70–.77) and malicious envy items (αs = .91–.93) as in Studies 2, 3, 5, 6, and 7. In Study 10, we took benign (α = .69) and malicious envy (α = .88) items from Lange and Crusius (2015; Study 3). In Studies 9 and 10, we matched their phrasing to the comparison domain of the scenario. In Study 11, the items were phrased generically covering different domains.

Studies 12 to 14 manipulated counterfactual thoughts within participants. In all of them, participants practiced formulating one upward counterfactual each when crossing Structure and Focus. Then, they imagined that an acquaintance proudly told them about a recent success, supposedly frustrating the participants because they did not have this success themselves. They then thought about what could have happened differently so that the situation would have turned out better. Participants' task was to generate a counterfactual thought. There were four different successes (i.e., a great vacation, a promotion at work, a reached fitness goal, or a new gadget/car) and for each success participants formulated one counterfactual when crossing Structure and Focus. Successes were randomly paired with counterfactual thoughts across participants. After each counterfactual, participants rated their benign (αs = .76–.89) and malicious envy (αs = .82–.94) with items whose content was similar to the ones taken from Crusius and Lange (2014) used in Studies 9 and 11, and phrased in generic way to cover all comparison domains.

Results

Table 5 presents descriptive statistics and central tests. As the main test of our hypotheses, we again conducted a meta-analysis. First, we used the package *bootES* (Kirby & Gerlanc, 2013; Version 1.2) to determine Cohen's d for both effects in each study. Second, we conducted a multiple-endpoint, random-

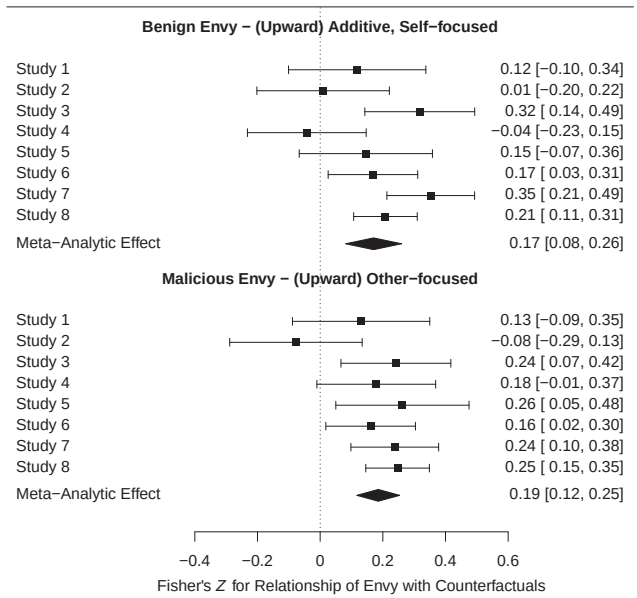

Figure 2. Forest plot for the meta-analysis of the correlational relationships of the forms of envy with counterfactual thoughts (Research Line 1). The top panel shows the relationship of self-reported benign envy with (upward) additive, self-focused counterfactuals. The bottom panel shows the relationship of self-reported malicious envy with (upward) other-focused counterfactuals.

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Table 4
Research Line 2: Overview of Operationalizations and Sample Characteristics

	Operationalization		Sample characteristics			
Study	Independent variables: Structure × Focus of Counterfactuals	Main dependent variables: Benign envy and malicious envy	Source	*n*	% Male	M_{age} (*SD*), Range
9	Academic achievement scenario; task: generate 3 counterfactuals per combination of design (between subjects)	Scales from Crusius and Lange (2014), tailored to comparison domain	Germany; local participant pool via email	180	31	25.3 (4.8), 18–59
10	Professional achievement scenario; task: generate 3 counterfactuals per combination (between subjects) after practicing respective counterfactual in unrelated domain	Scales from Lange and Crusius (2015; Study 3), tailored to comparison domain	United States; crowd sourcing (MTurk)	368	50	36.7 (12.9), 18–74
11	Recall of personal envy situation; task: generate 3 counterfactuals per combination (between subjects) after practicing respective counterfactual	Scales from Crusius and Lange (2014), generic phrasing for comparison domains	United States; crowd sourcing (MTurk)	353	40	34.5 (10.7), 18–73
12	Scenarios about upward comparison for vacation, professional achievement, fitness, or gadget; task: generate one counterfactual for each combination (within subjects) after practicing all counterfactuals in unrelated domains	Ad-hoc items similar to scales used in Crusius and Lange (2014), generic phrasing for comparison domains	United States; crowd sourcing (MTurk)	100	57	38.1 (11.6), 20–70
13	Scenarios about upward comparison for vacation, professional achievement, fitness, or car; task: generate one counterfactual for each combination (within subjects) after practicing all counterfactuals in unrelated domains	Ad-hoc items similar to scales used in Crusius and Lange (2014), generic phrasing for comparison domains	Germany; crowd sourcing (WorkHub)	91	54	32.2 (10.5), 18–59
14	Exact replication of Study 12		United States; crowd sourcing (MTurk)	207	51	37.9 (11.7), 18–70

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effects meta-analysis with Maximum Likelihood estimation using the package *metafor* (Version 2.1.0; Viechtbauer, 2010). We analyzed the effect of counterfactual thoughts on both envy forms simultaneously. Because we had two effects from each study, the effects were dependent. Moreover, three studies used a between-subjects design and three used a within-subjects design. To control this dependence, we conducted a multilevel model with effects nested in studies and a random intercept for studies nested in the kind of design. Moreover, we had to calculate the covariance of both effects in each study. Contrary to the meta-analyses on the effect of envy on counterfactual thoughts, we could not apply known formulas. This was because the specific contrasts for benign and malicious envy compared different subsets of participants, which these formulas do not account for. To estimate the covariances, we instead determined them from 10,000 bootstrap resamples generated in *bootES*. We also estimated the variances of both effects from the bootstrap resamples.

Figure 3 presents the forest plot of the meta-analysis. In line with our hypotheses, additive, self-focused counterfactual thoughts versus all others led to more benign envy ($d = 0.145$, $SE = 0.042$, $p < .001$, 95% CI [0.063, 0.227]), and other-focused versus self-focused counterfactual thoughts led to more malicious envy ($d = 0.170$, $SE = 0.040$, $p < .001$, 95% CI [0.091, 0.249]). Notably, when estimating the effects separately for between- and within-subjects designs, only within-subjects designs yielded statistically significant effects. In particular, in within-subjects designs, the effect of additive, self-focused counterfactual thoughts versus all others on benign envy was statistically significant ($d = 0.164$, $SE = 0.050$, $p = .001$, 95% CI [0.065, 0.263]), as was the effect of other-focused versus self-focused counterfactual thoughts on malicious envy ($d = 0.206$, $SE = 0.049$, $p < .001$, 95% CI [0.110, 0.301]). For between-subjects designs, the effect of additive, self-focused counterfactual thoughts versus all others on benign envy was

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Table 5
Research Line 2: Descriptive Statistics and Central Tests for All Studies Investigating Counterfactual Thoughts on Envy

	Benign envy			Malicious envy		
	Structure			Structure		
Focus	Additive *M* (*SD*)	Subtractive *M* (*SD*)	Central test[a]	Additive *M* (*SD*)	Subtractive *M* (*SD*)	Central test[b]
			Study 9			
Self	4.79 (1.05)	4.78 (0.84)	$F(1, 176) = 0.05$, $p = .82$, $\eta_p^2 < .001$	2.30 (1.14)	2.76 (1.41)	$F(1, 176) = 1.36$, $p = .25$, $\eta_p^2 = .01$
Other	4.64 (0.90)	4.83 (0.87)		2.60 (1.28)	2.93 (1.66)	
			Study 10			
Self	4.61 (1.03)	4.38 (1.12)	$F(1, 364) = 2.83$, $p = .09$, $\eta_p^2 = .01$	3.34 (1.55)	3.37 (1.47)	$F(1, 364) = 0.09$, $p = .77$, $\eta_p^2 < .001$
Other	4.41 (1.03)	4.42 (0.95)		3.49 (1.42)	3.31 (1.61)	
			Study 11			
Self	4.70 (1.17)	4.73 (1.11)	$F(1, 349) = 0.04$, $p = .85$, $\eta_p^2 < .001$	2.38 (1.55)	2.21 (1.33)	$F(1, 349) = 1.27$, $p = .26$, $\eta_p^2 = .004$
Other	4.67 (1.29)	4.62 (1.40)		2.32 (1.35)	2.61 (1.55)	
			Study 12			
Self	4.92 (1.58)	5.05 (1.46)	$F(1, 99) = 0.37$, $p = .55$, $\eta_p^2 = .004$	2.17 (1.40)	2.39 (1.40)	$F(1, 99) = 8.37$, $p = .01$, $\eta_p^2 = .08$
Other	4.70 (1.49)	4.76 (1.48)		2.49 (1.46)	2.54 (1.47)	
			Study 13			
Self	4.98 (1.31)	4.85 (1.44)	$F(1, 90) = 4.65$, $p = .03$, $\eta_p^2 = .05$	3.23 (1.47)	3.08 (1.36)	$F(1, 90) = 0.17$, $p = .68$, $\eta_p^2 = .002$
Other	4.80 (1.33)	4.73 (1.30)		3.08 (1.51)	3.28 (1.43)	
			Study 14			
Self	5.20 (1.22)	5.07 (1.31)	$F(1, 206) = 6.75$, $p = .01$, $\eta_p^2 = .03$	2.57 (1.55)	2.71 (1.69)	$F(1, 206) = 11.00$, $p = .001$, $\eta_p^2 = .05$
Other	5.02 (1.32)	4.91 (1.37)		2.85 (1.71)	2.85 (1.81)	

[a] Additive, self versus all others. [b] Self-focused versus other-focused.

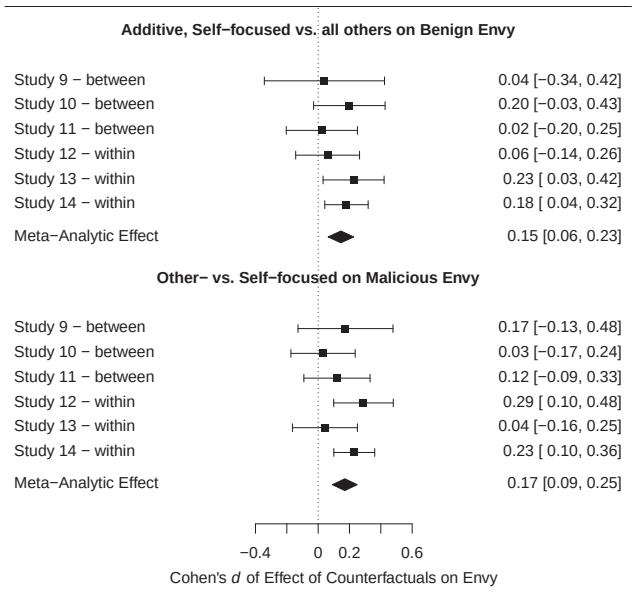

Figure 3. Forest plot for the meta-analysis of the effect of experimental manipulations of counterfactual thoughts on the two forms of envy (Research Line 2). The top panel shows the effect of generating additive, self-focused counterfactuals (vs. all other combinations) on self-reported benign envy. The bottom panel shows the effect other- versus self-focused counterfactuals on self-reported malicious envy.

not statistically significant ($d = 0.095$, $SE = 0.075$, $p = .204$, 95% CI [−0.052, 0.242]). Similarly, the effect of other-focused versus self-focused counterfactual thoughts on malicious envy ($d = 0.102$, $SE = 0.067$, $p = .127$, 95% CI [−0.029, 0.233]) was not statistically significant.

Discussion

The studies provide converging, meta-analytic support for the hypothesis that specific counterfactuals alter envious responding. Additive, self-focused counterfactuals led to more benign envy. Other-focused counterfactuals led to more malicious envy.

Even though the hypothesized pattern was robust when aggregating over all studies, the effects were descriptively stronger in the within-subject studies. This might be the case for several reasons. First, the within-subject studies likely had more statistical power than the between-subjects studies. Second, the procedure of the within-subject design may have highlighted the focal differences between the specific counterfactuals required in each experimental condition to the participants. On one level, this may have just improved the clarity of the complicated instruction. On another level, this difference may imply a conceptually weak effect (for a similar argument in a different research topic, see Kahneman, Knetsch, & Thaler, 1986) in that the effect is bound to a common frame of reference afforded by the within-subject design. In research on action-inaction effects in regret, comparisons of between and within-subjects designs have pointed to such reference effects (N′gbala & Branscombe, 1997) but have also led to methodological improvements that increase the sensitivity of measures in between-subjects designs (Zhang, Walsh, & Bonnefon, 2005). Thus, third, apart from statistical power and instructional clarity, the potential differences between the designs may also point to more substantive boundary conditions of the effect that may open avenues for further research.

General Discussion

Two complementary lines of research support that qualitative differences in counterfactual thinking distinguish benign and malicious envy. In the first, participants recalled episodes of benign and malicious envy and we assessed counterfactual thoughts generated by the emotional situations. We synthesized the results using meta-analyses across a methodologically diverse set of eight studies conducted in two different languages. The studies employed different methods to elicit the form of envy and generated and measured counterfactual thoughts in a variety of ways, such as coding open participant responses or self-report ratings.

Across the studies, benign envy was characterized by more (upward) additive, self-focused counterfactuals than malicious envy—thoughts about additional past actions that people could have taken to improve their outcome in comparison to superior others. Furthermore, malicious envy compared to benign envy was more strongly characterized by other-focused rather than self-focused counterfactuals. That is, malicious envy situations involved thoughts about actions that other people could or should have taken or not that would have led to a better outcome for themselves. Both findings emerged when comparing the benign and malicious envy episodes and when investigating the relationship of self-reported benign and malicious envy with the amount of the respective counterfactuals. The second line of research investigated whether specific counterfactuals have a causal effect on the experience of envy. Supporting this prediction, experimentally inducing (upward) additive counterfactuals about the self increased benign envy. Inducing (upward) counterfactual thoughts about other people increased malicious envy.

In line with research on other emotions such as shame and guilt (Niedenthal et al., 1994) or regret and disappointment (Zeelenberg et al., 1998) these findings underline that the content of counterfactual thinking can clarify pathways of emotional responding in structurally similar situations. The findings also contribute to the recent debate about the nature of envy (for a review, see Crusius, Gonzalez, et al., 2020). In particular, some researchers (e.g., Tai, Narayanan, & McAllister, 2012) have questioned whether the distinction between benign and malicious envy reflects qualitatively different emotional reactions or whether it merely reflects different behavioral outcomes of the same emotion. The present research answers their call for process-focused research. It suggests that benign and malicious envy rest on appraisal differences reflected in certain patterns of counterfactual thinking.

A strength of the findings is that they were robust in meta-analytic syntheses of a methodologically diverse set of experiments across two cultures. They entail all studies we conducted on this research question, including preliminary data sets that might be justifiably put to a file drawer. For example, during the research project, we learnt that it was difficult to instruct participants to generate the intended counterfactuals according to the combinations of the Structure × Focus design, potentially reducing the strength of the manipulation. We switched to more rigorous within-subject designs yielding more statistical power and improving the precision of the instruction. The meta-analyses show the

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hypothesized effects aggregating over these methodological differences. The variability in the results suggests boundaries to the strength of the effects. A limitation of our research is that it is difficult to interpret this variability.

Notably the aggregated effect sizes were small, particularly in the second line of research. Given our open lab approach, comparisons with traditional effect size conventions should be made with caution, however. The average effect size in social psychology is not only small (Richard, Bond, & Stokes-Zoota, 2003), average effect sizes in the field are also likely inflated by publication bias (Schäfer & Schwarz, 2019). Thus, relatively small effects should be expected when synthesizing methodologically diverse studies that depict entire research projects, including studies that led to refinements in design and instructions. Small effects may also be expected as some hypotheses involved ordinal interactions with dimensions of counterfactual thinking. A priori, such interactions have smaller effect sizes (Maxwell, Delaney, & Kelley, 2018). Apart from such methodological considerations, there are strong interindividual differences in the patterns of counterfactual thinking (Roese & Epstude, 2017) which the experimental manipulations intended to alter. Thus, even though small and variable effect sizes may not be surprising, they also call for further research investigating potential methodological and psychological moderators that allow delineating the practical significance of the effects.

Investigating the role of specific counterfactuals in envy may open a variety of future avenues of research. In particular, the specific content of counterfactuals has been linked to diverse psychological outcome variables, such as blame attribution (Alicke, Buckingham, Zell, & Davis, 2008; Branscombe et al., 1996), regulatory focus (Roese et al., 1999), and creativity (e.g., Markman, Lindberg, Kray, & Galinsky, 2007). Some of these outcomes show that counterfactuals link situational demands and behavioral intentions in content-specific pathways (Roese & Epstude, 2017). For example, by highlighting a certain action that would have improved the likelihood of one's own success, a counterfactual thought should increase the intention to perform this action in the future. However, counterfactuals can also influence motivation in a content-neutral pathway (Roese & Epstude, 2017) suggesting that benign and malicious envy may have generic motivational effects beyond the domain of comparison.

One way to shed light on content-specific and content-neutral motivational effects could be to investigate situational moderators that affect counterfactual thinking in envy-eliciting situations. Our reasoning implies that opportunity to improve in the desired domain should foster benign relative to malicious envy. Indeed, in research on counterfactuals, opportunity to alter the situation is often seen as the "master moderator" (Roese & Epstude, 2017, p. 13) prompting upward counterfactuals directed at performance improvement in contrast to downward counterfactuals associated with mood repair. Because of the dyadic nature of envy, however, upward counterfactuals involve more complexity. For malicious envy, perceptions of opportunity may also regard potential ways to reduce the relative advantage of the other, and upward counterfactuals may thus fuel (hostile) action. As reasoned in the introduction, other-focused, upward counterfactuals may also offer excuses for inferior outcomes and could immunize the self against threatening social comparisons. They could thus lead to complacency and generally reduced motivation if perceived opportunity is low. That certain upward counterfactuals in envy allow mood repair may also be a reason for our finding that the prevalence of downward counterfactuals ("It could have been worse") was negligible. We suspect that such counterfactuals could nevertheless emerge in malicious envy if the envy-eliciting situation is incompatible with any of the potential functions of upward counterfactuals. Taken together, investigating particular situational appraisals of opportunity and routes to self-protection may clarify how content-specific and content-neutral motivation results from envious counterfactuals.

We focused on counterfactuals in benign versus malicious envy, limiting us to interpreting differences between these emotions. An interesting avenue for future research is to compare envious counterfactuals with those of neighboring emotions. For example, a recent debate concerns the motivational differences between benign envy and the affectively positive emotion admiration (Archer, 2019; Onu, Kessler, & Smith, 2016; Van de Ven, 2017). Given that admiration involves comparison domains that are less self-relevant and thus, presumably, less threatening than those of benign envy (Van de Ven et al., 2009), we predict that admiration elicits self-focused counterfactuals to a lesser extent than benign envy. Admiration often seems to be directed at others who demonstrate excellence by specific actions against great odds (Onu et al., 2016; Schindler, Zink, Windrich, & Menninghaus, 2013). For this reason, counterfactuals in admiration may often be other-focused and downward. This reduced counterfactual self-focus may align with the finding that upward, emulative motivation in admiration is more abstract and less immediate than motivation in benign envy (Crusius, Blatz, & Lange, 2020).

Diverging counterfactuals may also elucidate differences between malicious envy and (righteous) resentment, that are frequently discussed in prior research (Smith & Kim, 2007; Van de Ven et al., 2009). Malicious envy and resentment are highly similar, as both are affectively negative and involve hostility. As resentment does not involve social comparisons to the degree of malicious envy (Van de Ven et al., 2009), we predict that it is even more strongly characterized by other-focused counterfactuals. Furthermore, resentment is focused more strongly on intentional wrongdoing of the target person compared to malicious envy (Smith & Kim, 2007; Van de Ven et al., 2009). In contrast, malicious envy may be characterized by the more subjective feeling that superior outcomes of the target person are the result of unfair advantages (Smith, Parrott, Ozer, & Moniz, 1994). Considering these differences, it might be fruitful to further distinguish whether other-focused counterfactual focus on the target person or third parties. We suspect that resentment will often involve counterfactuals that focus on actions of the resented person, whereas malicious envy may often involve counterfactuals about actions of others that favored the envied person. Furthermore, resentment may often involve counterfactuals that stress a worse outcome for the target person in absolute terms and are, thus, upward only by implication. In contrast, malicious envy may more often involve other-focused counterfactuals that stress a change in the relative standing of the perceiver and the target person.

Finally, changing counterfactual thoughts may complement other strategies intended to alter envious responses (see, e.g., Exline & Zell, 2008). For example, from an applied, organizational perspective, it may often be desirable to prevent the socially destructive consequences of malicious envy. Changing envious

counterfactuals may be a useful tool to achieve this goal. The current studies provide initial support for the possibility that ensuing envious responses can be accentuated by focusing on specific counterfactual thoughts. Past research shows that activating counterfactual thoughts can also alter how we think about episodes in the past (De Brigard, Hanna, Jacques, & Schacter, 2019). In the current set of studies, only one experiment (Study 11) involved activating counterfactuals about a past episode of envy. In isolation, the results of this dataset are inconclusive. Future research may investigate whether and how intentionally changing counterfactual thoughts may influence such episodes successfully.

Taken together, the studies complement and extend earlier research showing that counterfactual thinking predicts the intensity of envy (Van de Ven & Zeelenberg, 2015). Resting on functional accounts of counterfactual thinking (Roese & Epstude, 2017) and envy (Crusius & Lange, 2017; Van de Ven et al., 2009), they suggest that specific counterfactuals reflect and shape envious responding. Situational demands may thus elicit certain counterfactual thoughts that underlie benign versus malicious envy in line with their functions. If these counterfactuals are focused on additional actions that people could have taken themselves to improve their outcome, the corresponding emotion of benign envy may serve to improve the envier's situation. If these counterfactuals are focused on the actions of other people, the corresponding emotion of malicious envy may serve to protect self-esteem by tearing others down.

References

Alicke, M. D., Buckingham, J., Zell, E., & Davis, T. (2008). Culpable control and counterfactual reasoning in the psychology of blame. *Personality and Social Psychology Bulletin, 34,* 1371–1381. http://dx.doi.org/10.1177/0146167208321594

Archer, A. (2019). Admiration and motivation. *Emotion Review, 11,* 140–150. http://dx.doi.org/10.1177/1754073918787235

Barnett, H. G. (1953). *Innovation: The basis of cultural change*. New York, NY: McGraw-Hill. http://dx.doi.org/10.1177/000271625328800156

Belk, R. (2011). Benign envy. *AMS Review, 1,* 117–134. http://dx.doi.org/10.1007/s13162-011-0018-x

Ben-Ze'ev, A. (1992). Envy and inequality. *The Journal of Philosophy, 89,* 551–581. http://dx.doi.org/10.2307/2941056

Branscombe, N. R., Owen, S., Garstka, T. A., & Coleman, J. (1996). Rape and accident counterfactuals: Who might have done otherwise and would it have changed the outcome? *Journal of Applied Social Psychology, 26,* 1042–1067. http://dx.doi.org/10.1111/j.1559-1816.1996.tb01124.x

Braun, S., Aydin, N., Frey, D., & Peus, C. V. (2015). Leader narcissism predicts followers' malicious envy and counterproductive work behaviors. *Academy of Management Proceedings, 2015,* 16115. http://dx.doi.org/10.5465/ambpp.2015.16115abstract

Brooks, A. W., Huang, K., Abi-Esber, N., Buell, R. W., Huang, L., & Hall, B. (2019). Mitigating malicious envy: Why successful individuals should reveal their failures. *Journal of Experimental Psychology: General, 148,* 667–687. http://dx.doi.org/10.1037/xge0000538

Byrne, R. M. J. (2016). Counterfactual thought. *Annual Review of Psychology, 67,* 135–157. http://dx.doi.org/10.1146/annurev-psych-122414-033249

Chan, C.-H., Chan, G. C. H., Leeper, T. J., & Becker, J. (2018). *rio: A Swiss-army knife for data file I/O* (R package Version 0.5.16) [Computer software]. Retrieved from https://CRAN.R-project.org/package=rio

Cohen-Charash, Y., & Mueller, J. S. (2007). Does perceived unfairness exacerbate or mitigate interpersonal counterproductive work behaviors related to envy? *Journal of Applied Psychology, 92,* 666–680. http://dx.doi.org/10.1037/0021-9010.92.3.666

Coricelli, G., & Rustichini, A. (2010). Counterfactual thinking and emotions: Regret and envy learning. *Philosophical Transactions of the Royal Society of London Series B, Biological Sciences, 365,* 241–247. http://dx.doi.org/10.1098/rstb.2009.0159

Corneo, G., & Jeanne, O. (2001). On relative-wealth effects and long-run growth. *Research in Economics, 55,* 349–358. http://dx.doi.org/10.1006/reec.2001.0260

Crusius, J., Blatz, L., & Lange, J. (2020). *Telescopes and microscopes of motivation: Emulative goals in admiration and envy differ in abstractness and temporal orientation*. Unpublished manuscript, Social Cognition Center Cologne, University of Cologne, Cologne, Germany.

Crusius, J., Gonzalez, M. F., Lange, J., & Cohen-Charash, Y. (2020). Envy: An adversarial review and comparison of two competing views. *Emotion Review, 12,* 3–21. http://dx.doi.org/10.1177/1754073919873131

Crusius, J., & Lange, J. (2014). What catches the envious eye? Attentional biases within malicious and benign envy. *Journal of Experimental Social Psychology, 55,* 1–11. http://dx.doi.org/10.1016/j.jesp.2014.05.007

Crusius, J., & Lange, J. (2017). How do people respond to threatened social status? Moderators of benign versus malicious envy. In R. H. Smith, U. Merlone, & M. K. Duffy (Eds.), *Envy at work and in organizations* (pp. 85–110). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780190228057.003.0004

Crusius, J., & Mussweiler, T. (2012). When people want what others have: The impulsive side of envious desire. *Emotion, 12,* 142–153. http://dx.doi.org/10.1037/a0023523

Davis, C. G., Lehman, D. R., Wortman, C. B., Silver, R. C., & Thompson, S. C. (1995). The undoing of traumatic life events. *Personality and Social Psychology Bulletin, 21,* 109–124. http://dx.doi.org/10.1177/0146167295212002

De Brigard, F., Hanna, E., Jacques, P. L. S., & Schacter, D. L. (2019). How thinking about what could have been affects how we feel about what was. *Cognition and Emotion, 33,* 646–659. http://dx.doi.org/10.1080/02699931.2018.1478280

Ekman, P., Levenson, R., & Friesen, W. (1983). Autonomic nervous system activity distinguishes among emotions. *Science, 221,* 1208–1210. http://dx.doi.org/10.1126/science.6612338

Elster, J. (1999). *Alchemies of the mind*. Cambridge, UK: Cambridge University Press.

Epstude, K., & Roese, N. J. (2008). The functional theory of counterfactual thinking. *Personality and Social Psychology Review, 12,* 168–192. http://dx.doi.org/10.1177/1088868308316091

Exline, J. J., & Zell, A. L. (2008). Antidotes to envy: A conceptual framework. In R. H. Smith (Ed.), *Envy: Theory and research* (pp. 315–331). New York, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780195327953.003.0017

Falcon, R. G. (2015). Is envy categorical or dimensional? An empirical investigation using taxometric analysis. *Emotion, 15,* 694–698. http://dx.doi.org/10.1037/emo0000102

Frijda, N. H. (2007). *The laws of emotion*. Mahwah, NJ: Lawrence Erlbaum.

Gino, F., & Pierce, L. (2009). Dishonesty in the name of equity. *Psychological Science, 20,* 1153–1160. http://dx.doi.org/10.1111/j.1467-9280.2009.02421.x

Gleser, L. J., & Olkin, I. (2009). Stochastically dependent effect sizes. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *Handbook of research synthesis and meta-analysis* (pp. 357–376). New York, NY: Russell Sage Foundation.

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, NY: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780195327953.003.0004

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IBM Corp. (2016). *IBM SPSS statistics for Windows* (Version 24.0). Armonk, NY: Author.

Kahneman, D. (1999). Objective happiness. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 3–25). New York, NY: Russell Sage Foundation.

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1986). Fairness and the assumptions of economics. *The Journal of Business, 59*, 285–230. http://dx.doi.org/10.1086/296367

Kirby, K. N., & Gerlanc, D. (2013). *bootES*: An R package for bootstrap confidence intervals on effect sizes. *Behavior Research Methods, 45*, 905–927. http://dx.doi.org/10.3758/s13428-013-0330-5

Kwon, M., Han, Y., & Nam, M. (2017). Envy takes you further: The influence of benign envy on risk taking. *Social Behavior and Personality, 45,* 39–50. http://dx.doi.org/10.2224/sbp.5977

Lange, J., Blatz, L., & Crusius, J. (2018). Dispositional envy: A conceptual review. In V. Zeigler-Hill & T. K. Shackelford (Eds.), *The SAGE handbook of personality and individual differences. Volume III: Applications of personality and individual differences* (pp. 424–439). London, UK: SAGE. http://dx.doi.org/10.4135/9781526451248.n18

Lange, J., & Crusius, J. (2015). The tango of two deadly sins: The social-functional relation of envy and pride. *Journal of Personality and Social Psychology, 109,* 453–472. http://dx.doi.org/10.1037/pspi0000026

Lange, J., Crusius, J., & Hagemeyer, B. (2016). The Evil Queen's dilemma: Linking narcissistic admiration and rivalry to benign and malicious envy. *European Journal of Personality, 30,* 168–188. http://dx.doi.org/10.1002/per.2047

Lange, J., Weidman, A. C., & Crusius, J. (2018). The painful duality of envy: Evidence for an integrative theory and a meta-analysis on the relation of envy and schadenfreude. *Journal of Personality and Social Psychology, 114,* 572–598. http://dx.doi.org/10.1037/pspi0000118

Larrick, R. P. (1993). Motivational factors in decision theories: The role of self-protection. *Psychological Bulletin, 113,* 440–450. http://dx.doi.org/10.1037/0033-2909.113.3.440

Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology, 73,* 91–103. http://dx.doi.org/10.1037/0022-3514.73.1.91

Mandel, D. (2003). Counterfactuals, emotions, and context. *Cognition and Emotion, 17,* 139–159. http://dx.doi.org/10.1080/02699930302275

Mandel, D. R., & Dhami, M. K. (2005). "What I did" versus "what I might have done": Effect of factual versus counterfactual thinking on blame, guilt, and shame in prisoners. *Journal of Experimental Social Psychology, 41,* 627–635. http://dx.doi.org/10.1016/j.jesp.2004.08.009

Markman, K. D., Gavanski, I., Sherman, S. J., & McMullen, M. N. (1993). The mental simulation of better and worse possible worlds. *Journal of Experimental Social Psychology, 29,* 87–109. http://dx.doi.org/10.1006/jesp.1993.1005

Markman, K. D., Lindberg, M. J., Kray, L. J., & Galinsky, A. D. (2007). Implications of counterfactual structure for creative generation and analytical problem solving. *Personality and Social Psychology Bulletin, 33,* 312–324. http://dx.doi.org/10.1177/0146167206296106

Maxwell, S. E., Delaney, H. D., & Kelley, K. (2018). *Designing experiments and analyzing data: A model comparison perspective* (3rd ed.). New York, NY: Routledge. http://dx.doi.org/10.4324/9781315642956

McCrea, S. M. (2008). Self-handicapping, excuse making, and counterfactual thinking: Consequences for self-esteem and future motivation. *Journal of Personality and Social Psychology, 95,* 274–292. http://dx.doi.org/10.1037/0022-3514.95.2.274

Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods, 17,* 437–455. http://dx.doi.org/10.1037/a0028085

Meier, A., & Schäfer, S. (2018). The positive side of social comparison on social network sites: How envy can drive inspiration on Instagram. *Cyberpsychology, Behavior, and Social Networking, 21,* 411–417. http://dx.doi.org/10.1089/cyber.2017.0708

Montal-Rosenberg, R., & Moran, S. (2020). Envy and help giving. *Journal of Personality and Social Psychology*. Advance online publication. http://dx.doi.org/10.1037/pspi0000340

Moran, S., & Schweitzer, M. E. (2008). When better is worse: Envy and the use of deception. *Negotiation and Conflict Management Research, 1,* 3–29. http://dx.doi.org/10.1111/j.1750-4716.2007.00002.x

Morewedge, C. K., Zhu, M., & Buechel, E. C. (2019). Hedonic contrast effects are larger when comparisons are social. *Journal of Consumer Research, 46,* 286–306. http://dx.doi.org/10.1093/jcr/ucy070

Moyal, A., Motsenok, M., & Ritov, I. (2020). Arbitrary social comparison, malicious envy, and generosity. *Journal of Behavioral Decision Making, 33,* 444–462. http://dx.doi.org/10.1002/bdm.2172

Niedenthal, P. M., Tangney, J. P., & Gavanski, I. (1994). "If only I weren't" versus "If only I hadn't": Distinguishing shame and guilt in counterfactual thinking. *Journal of Personality and Social Psychology, 67,* 585–595. http://dx.doi.org/10.1037/0022-3514.67.4.585

N′gbala, A., & Branscombe, N. R. (1997). When does action elicit more regret than inaction and is counterfactual mutation the mediator of this effect? *Journal of Experimental Social Psychology, 33,* 324–343. http://dx.doi.org/10.1006/jesp.1996.1322

Onu, D., Kessler, T., & Smith, J. R. (2016). Admiration: A conceptual review. *Emotion Review, 8,* 218–230. http://dx.doi.org/10.1177/1754073915610438

R Core Team. (2019). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org

Revelle, W. (2020). *psych: Procedures for psychological, psychometric, and personality research* (Version 1.9.12.31) [Computer software]. Retrieved from https://CRAN.R-project.org/package=psych

Richard, F. D., Bond, C. F., Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology, 7,* 331–363. http://dx.doi.org/10.1037/1089-2680.7.4.331

Roese, N. J. (1994). The functional basis of counterfactual thinking. *Journal of Personality and Social Psychology, 66,* 805–818. http://dx.doi.org/10.1037/0022-3514.66.5.805

Roese, N. J., & Epstude, K. (2017). The functional theory of counterfactual thinking: New evidence, new challenges, new insights. In J. M. Olson (Ed.), *Advances in experimental social psychology* (Vol. 56, pp. 1–79). Cambridge, MA: Academic Press. http://dx.doi.org/10.1016/bs.aesp.2017.02.001

Roese, N. J., Hur, T., & Pennington, G. L. (1999). Counterfactual thinking and regulatory focus: Implications for action versus inaction and sufficiency versus necessity. *Journal of Personality and Social Psychology, 77,* 1109–1120. http://dx.doi.org/10.1037/0022-3514.77.6.1109

Roese, N. J., & Olson, J. M. (1993a). Self-esteem and counterfactual thinking. *Journal of Personality and Social Psychology, 65,* 199–206. http://dx.doi.org/10.1037/0022-3514.65.1.199

Roese, N. J., & Olson, J. M. (1993b). The structure of counterfactual thought. *Personality and Social Psychology Bulletin, 19,* 312–319. http://dx.doi.org/10.1177/0146167293193008

Roese, N. J., Smallman, R., & Epstude, K. (2017). Do episodic counterfactual thoughts focus on controllable action? The role of self-initiation. *Journal of Experimental Social Psychology, 73,* 14–23. http://dx.doi.org/10.1016/j.jesp.2017.05.006

Roseman, I. J., Wiest, C., & Swartz, T. S. (1994). Phenomenology, behaviors, and goals differentiate discrete emotions. *Journal of Personality and Social Psychology, 67,* 206–221. http://dx.doi.org/10.1037/0022-3514.67.2.206

Salerno, A., Laran, J., & Janiszewski, C. (2019). The bad can be good: When benign and malicious envy motivate goal pursuit. *Journal of Consumer Research, 46,* 388–405. http://dx.doi.org/10.1093/jcr/ucy077

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Salovey, P., & Rodin, J. (1984). Some antecedents and consequences of social-comparison jealousy. *Journal of Personality and Social Psychology, 47,* 780–792. http://dx.doi.org/10.1037/0022-3514.47.4.780

Sawada, M., & Fujii, T. (2016). Do envious people show better performance? Focusing on the function of benign envy as personality trait. *Japanese Journal of Psychology, 87,* 198–204. http://dx.doi.org/10.4992/jjpsy.87.15316

Schäfer, T., & Schwarz, M. A. (2019). The meaningfulness of effect sizes in psychological research: Differences between sub-disciplines and the impact of potential biases. *Frontiers in Psychology, 10,* 813. http://dx.doi.org/10.3389/fpsyg.2019.00813

Schaubroeck, J., & Lam, S. S. K. (2004). Comparing lots before and after: Promotion rejectees' invidious reactions to promotees. *Organizational Behavior and Human Decision Processes, 94,* 33–47. http://dx.doi.org/10.1016/j.obhdp.2004.01.001

Schindler, I., Zink, V., Windrich, J., & Menninghaus, W. (2013). Admiration and adoration: Their different ways of showing and shaping who we are. *Cognition and Emotion, 27,* 85–118. http://dx.doi.org/10.1080/02699931.2012.698253

Smallets, S., Streamer, L., Kondrak, C. L., & Seery, M. D. (2016). Bringing you down versus bringing me up: Discrepant versus congruent high explicit self-esteem differentially predict malicious and benign envy. *Personality and Individual Differences, 94,* 173–179. http://dx.doi.org/10.1016/j.paid.2016.01.007

Smith, R. H., & Kim, S. H. (2007). Comprehending envy. *Psychological Bulletin, 133,* 46–64. http://dx.doi.org/10.1037/0033-2909.133.1.46

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. http://dx.doi.org/10.1177/0146167294206008

Smith, R. H., Turner, T. J., Garonzik, R., Leach, C. W., Urch-Druskat, V., & Weston, C. M. (1996). Envy and schadenfreude. *Personality and Social Psychology Bulletin, 22,* 158–168. http://dx.doi.org/10.1177/0146167296222005

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin, 87,* 245–251. http://dx.doi.org/10.1037/0033-2909.87.2.245

Tai, K., Narayanan, J., & McAllister, D. J. (2012). Envy as pain: Rethinking the nature of envy and its implications for employees and organizations. *Academy of Management Review, 37,* 107–129. http://dx.doi.org/10.5465/amr.2009.0484

Teigen, K. H. (1997). Luck, envy and gratitude: It could have been different. *Scandinavian Journal of Psychology, 38,* 313–323. http://dx.doi.org/10.1111/1467-9450.00041

Tyser, M. P., McCrea, S. M., & Knüpfer, K. (2012). Pursuing perfection or pursuing protection? Self-evaluation motives moderate the behavioral consequences of counterfactual thoughts. *European Journal of Social Psychology, 42,* 372–382. http://dx.doi.org/10.1002/ejsp.1864

Van de Ven, N. (2017). Envy and admiration: Emotion and motivation following upward social comparison. *Cognition and Emotion, 31,* 193–200. http://dx.doi.org/10.1080/02699931.2015.1087972

Van de Ven, N., Hoogland, C. E., Smith, R. H., van Dijk, W. W., Breugelmans, S. M., & Zeelenberg, M. (2015). When envy leads to schadenfreude. *Cognition and Emotion, 29,* 1007–1025. http://dx.doi.org/10.1080/02699931.2014.961903

Van de Ven, N., & Zeelenberg, M. (2015). On the counterfactual nature of envy: "It could have been me." *Cognition and Emotion, 29,* 954–971. http://dx.doi.org/10.1080/02699931.2014.957657

Van de Ven, N., Zeelenberg, M., & Pieters, R. (2009). Leveling up and down: The experience of benign and malicious envy. *Emotion, 3,* 419–429. http://dx.doi.org/10.1037/a0015669

Van de Ven, N., Zeelenberg, M., & Pieters, R. (2011a). The envy premium in product evaluation. *Journal of Consumer Research, 37,* 984–998. http://dx.doi.org/10.1086/657239

Van de Ven, N., Zeelenberg, M., & Pieters, R. (2011b). Why envy outperforms admiration. *Personality and Social Psychology Bulletin, 37,* 784–795. http://dx.doi.org/10.1177/0146167211400421

Van de Ven, N., Zeelenberg, M., & Pieters, R. (2012). Appraisal patterns of envy and related emotions. *Motivation and Emotion, 36,* 195–204. http://dx.doi.org/10.1007/s11031-011-9235-8

Viechtbauer, W. (2010). Conducting meta-analyses in R with the *metafor* package. *Journal of Statistical Software, 36,* 1–48. http://dx.doi.org/10.18637/jss.v036.i03

Zeelenberg, M., van Dijk, W. W., van der Pligt, J., Manstead, A. S. R., van Empelen, P., & Reinderman, D. (1998). Emotional reactions to the outcomes of decisions: The role of counterfactual thought in the experience of regret and disappointment. *Organizational Behavior and Human Decision Processes, 75,* 117–141. http://dx.doi.org/10.1006/obhd.1998.2784

Zhang, J. H., Walsh, C., & Bonnefon, J.-F. (2005). Between-subject or within-subject measures of regret: Dilemma and solution. *Journal of Experimental Social Psychology, 41,* 559–566. http://dx.doi.org/10.1016/j.jesp.2004.10.004

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