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On the Counterfactual Nature of Envy: "It Could Have Been Me"

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Abstract

We examined whether counterfactual thinking influences the experience of envy. Counterfactual thinking refers to comparing the situation as it is to what it could have been, and these thought processes have been shown to lead to a variety of emotions. We predicted that for envy the counterfactual thought "it could have been me" would be important. In four studies we found a clear link between such counterfactual thoughts and the intensity of envy. Furthermore, in Studies 3 and 4 revealed that a manipulation known to affect the extent of counterfactual thinking (the perception of being close to obtaining the desired outcome oneself), had an effect on the intensity of envy via counterfactual thoughts. This relationship between counterfactual thinking and the experience of envy allows for new predictions concerning situations under which envy is likely be more intense.

Keywords: envy, counterfactual thinking, appraisal, social comparison

On the Counterfactual Nature of Envy: "It Could Have Been Me"

Envy is the emotion that can arise when someone else is better off in a domain that we find important. For example, people are envious of a neighbour's new car, a colleague's hard-earned promotion, or the undeservedly high grade of a classmate. It is a frustrating experience that can lead to both a desire that the other loses the advantage and a motivation to improve oneself (Parrot & Smith, 1993; Smith & Kim, 2007; Van de Ven, Zeelenberg, & Pieters, 2009). Here we hypothesize that counterfactual thinking (generating thoughts about how the current situation could have been different; Roese, 1997), impacts the intensity of the emotion envy. Counterfactual thinking has been shown to influence a number of emotions, such as guilt and shame (Niedenthal, Tangney, & Gavanski, 1994; Mandel & Dhami, 2005), regret and disappointment (Zeelenberg, Van Dijk, Van der Pligt, Manstead, Van Empelen, & Reinderman, 1998), and sadness (Mandel, 2003). We believe counterfactual thoughts to also play a key role for envy.

We base this expectation on the fact that counterfactuals are comparative thoughts, and that envy is inherently a comparison-based emotion in which another person serves as the input of the comparison. We are not the first to predict that counterfactual thinking increases the intensity of envy (Ben Ze'ev, 1992; Coricelli & Rustichini, 2010; Elster, 1991), but to the best of our knowledge we are not aware of a direct empirical test of this relationship. Expecting a relationship between counterfactuals and emotions is also consistent with Frijda's (1988) laws of emotion that describe the regularities of emotional experience. As a case in point, Frijda's Law of Comparative Feeling states that "The intensity of emotion depends on the relationship between an event and some frame of reference against which the event is evaluated" (p. 353). We first discuss the relevant literature regarding envy and counterfactual thinking, and next present the studies testing the relationship between counterfactual thoughts and the intensity of envy.

Envy

Envy is the pain caused by the good fortune of others (Aristotle, 350BC/1954). Experiencing it is condemned in the catholic tradition (as it is one of the seven deadly sins) and is generally considered to be a socially undesirable response. This negative view of envy is not surprising, as research found it to lead to a variety of negative behavior (from irrational decision-making to negative behavior towards the envied person, see Smith & Kim, 2007, for an overview). Furthermore, people who often experience envy are typically less satisfied with their life (Smith, Parrott, Diener, Hoyle, & Kim, 1999). At the same time, envy can be a productive emotion leading to positive outcomes. Envy can motivate people to do better (Van de Ven et al., 2009), for example by motivating to improve one's position in an organization (Schaubroeck & Lam, 2004) and by actually increasing effort and performance on intellectual tasks (Van de Ven, Zeelenberg, & Pieters, 2011).

For an emotion with such consequential motivational effects (both constructive and destructive), it is important to find out when people experience it and which factors amplify or attenuate the experience. Specifically, we expected that the more people think the counterfactual thought "*it could have been me in that situation*", the stronger their envy will be. Let us now turn to the relevant literature on counterfactual thinking.

Counterfactual Thinking

Counterfactual thoughts are thoughts about how the present situation could have been different, and people typically compare the situation as it is to what it could have been (Kahneman & Miller, 1986; Roese, 1997). The comparative aspect is at the core of counterfactual thinking and thus also at the core of how counterfactual thinking relates to emotions (e.g., Van Dijk & Zeelenberg, 2005). Counterfactual thinking gives rise to feelings of general affect, as for example found in research on Olympic medalists (Medvec, Madey, & Gilovich, 1995). These authors found that silver medalists displayed more agony than bronze

medalists, as the silver medalists focused on the gold they could have had, while the bronze medalists focused on all those other athletes that did not have a medal.

Furthermore, counterfactual thinking also gives rise to specific emotions. For example, research found that regret arises if one realizes that if a different decision was made, a bad outcome would have been prevented. These counterfactual thoughts can take the form of "if only I had…". For disappointment these thoughts typically take the form of "if only it was …" (Zeelenberg et al., 1998). Shame and guilt can also be distinguished by the type of counterfactual thoughts that lead to these emotions (Niedenthal et al., 1994). Shame is related to counterfactual thoughts like "if only I weren't…" and guilt to counterfactual thoughts like "if only I hadn't…". These are all examples of how upward counterfactuals, in which reality is compared to a better alternative, trigger certain specific emotions. Downward counterfactuals, in which reality is compared to a worse alternative, can elicit emotions such as relief or gratitude when one finds out that a situation could have been much worse (Teigen, 1997). With the current research we expected to be able to also add envy to this list of emotions that are being influenced by counterfactual thinking.

Counterfactual thinking appears to mainly serve two important functions (Roese, 1994). The first is that it helps affect regulation, as a realization that one could have been worse off (called a downward counterfactual) makes one feel better. For example, people who survive a plane crash can describe themselves as lucky, because a salient counterfactual to them compares their state to the unlucky people in the plane who did not survive (Teigen, 1995, 1997).

The second function of counterfactual thinking is that it has a preparative function that helps people to improve their future situation (Roese, 1994; Epstude & Roese, 2008; Zeelenberg, 1999). This learning function mainly applies to upward counterfactuals, comparisons where the situation could have been better than it currently is. For example,

people experience regret if they realize that their situation would have been better if only they had made a different choice (Zeelenberg et al., 1998). The more salient this counterfactual is, the stronger the experienced regret is. Experiencing regret over past mistakes helps people to learn and prevent these mistakes in the future, and thus be better prepared in future situations. Envy also helps to prepare a person to take action to improve one's relative position in the social hierarchy (Smith & Kim, 2007; Van de Ven et al., 2009). If counterfactual thinking indeed leads to more intense envy, this also fits this preparative function as it helps to prepare a person better to deal with that situation.

Why we expect counterfactual thinking to be related to envy

For envy the counterfactual thought implies a social comparison in which one contrasts one's own situation to that of the other. In the current research we focus on the strength of the counterfactual thought and relate it to the intensity of envy. We thus examine whether it is the case that the more people think "it could have been me", the more intense the envy is that they feel. This follows the suggestions made by others that envy and counterfactual thinking are likely to be related (Ben Ze'ev, 1992; Coricelli & Rustichini, 2010; Elster, 1991).

Envy is inherently a comparative emotion: it arises from comparing one's own situation to that of a superior other (Smith & Kim, 2007). Indeed, a significant correlation exists between the dispositional tendency to compare one's own situation to that of others with dispositional envy (Smith et al., 1999; Zeelenberg & Pieters, 2007). When people recall a situation in which they were envious, they practically always make an explicit comparison to the other (e.g., my friend got a 9 for an exam, while I studied much harder and only received a 7; Van de Ven et al., 2009). Precisely because of this comparative nature, we expected that more counterfactual thinking leads to more intense envy.

Note that counterfactual thinking is often studied by examining the number of counterfactuals people generate when engaging in counterfactual thinking. Someone who

missed a train by a minute typically generates more thoughts about how that situation could have been different (if only I had not snoozed after my alarm clock sounded, if only that final traffic light had been green, etc.), compared to someone who missed the train by 15 minutes. In the current studies we do not test *how many* counterfactuals people generate, but *how easily* someone engages in the specific counterfactual we expected to be associated with envy. With this we aimed to stay closer to the original ideas of Kahneman and colleagues about the link between counterfactuals and emotional amplification. Kahneman and Tversky (1982) indicated that the easier it is to think of a situation, the more likely someone thinks that situation is likely to occur. Kahneman and Miller (1986) refer to this process when explaining the difference in emotional reactions by two men to missing a flight with a small or wide margin. If a person misses the plane by a small margin, it is easier to imagine an alternative situation which then makes the resulting emotional reaction stronger.

The current studies

In the current studies we tested whether stronger counterfactual thoughts are related to the intensity of envy. We predicted that the more someone thinks "it could have been me", the more they will experience envy. This straightforward relationship (a correlation) is tested in four studies. Note that we think it likely that the counterfactual thought often precedes the experience of envy, but also that these thoughts may follow from the experience. Typically, certain cognitive appraisals of the situation trigger certain emotions (Frijda, 1988; Roseman, Antoniou, & Jose, 1996). At the same time, specific emotions also contain specific thought patterns (Roseman, Wiest, & Swartz, 1994), and the experience of specific emotions can cause us to interpret new situations in line with that emotion (e.g., Lerner & Keltner, 2001). Envy might thus not only be caused by thoughts of "it could have been me", but also give rise to those thoughts (see also Elster, 1991). We will come back to this in the general discussion section.

Besides testing the relationship between counterfactual thinking and envy correlationally, we also manipulated closeness to the outcome in Studies 3 and 4. Kahneman and Varey (1990; see also Roese, 1997) stated that the closer people are to obtaining a certain outcome, the more they will engage in counterfactual thinking. We expected that manipulations that make people feel closer to obtaining the desired outcome someone else has, would trigger stronger counterfactual thoughts and thereby also more envy. Finally, in Studies 3 and 4 we also manipulated an antecedent of envy. Domains that are more important to one's self-view elicit more envy (Salovey & Rodin, 1991). We wanted to explore whether these manipulations would not only influence envy, but would also influence counterfactual thoughts. Note that across all studies, we report how we determined our sample size, all data exclusions, all manipulations, and all measures.

Study 1

In Study 1 people autobiographically recalled an envy episode and indicated felt envy and whether they engaged in counterfactual thinking. We expected that the more they had engaged in counterfactual thinking (the more they had thought "it could have been me"), the more intense their envy would be.

Participants were recruited via Amazon MTurk and received $0.45 for a 4.5 minute survey. We restricted our sample to U.S. based participants, with a good standing as MTurk workers (> 95% acceptance rate). We aimed for 300 participants (95% power to detect a correlation of .20), and got 275 (166 males and 109 females; M_{age} = 28.19 years, SD = 8.60, range 18-64) who completed it.[1] .

Participants were asked to "Recall a situation in which someone else was better off than you were in a domain that you found to be rather important yourself. For example, someone got a better grade than you, made more money, won a prestigious award, etc." We asked them to spend a minute or two describing the situation. We explained that some details

were necessary so a reader would understand the basic situation. After this, participants

responded to two questions regarding the recalled situation. The first question asked for the

counterfactual thought: *How much did you think "it could have been me"?*, the second

question asked for their envy: *Did you feel a little envious of the person who was better off?*

Both questions were answered on a scale from 0 (*not at all*) to 6 (*very much so*).[2]

On average, the responses (on the 0 – 6 scale) clearly indicated that participants agreed

with the statement that they had generated counterfactual thoughts ($M = 4.52$, $SD = 1.65$) and

had felt envious ($M = 4.73$, $SD = 1.37$) in the recalled situation. We found the predicted

relationship between counterfactual thoughts and envy, $r(273) = .26$, $p < .0001$. The more

participants had thought *it could have been me*, the more they had also experienced envy.

Study 2

Study 2 resembled Study 1 and used the same recall procedure. The main difference is

that we now used multi-item, reliable and validated scales to measure counterfactual thinking

(Counterfactual Thinking for Negative Events Scale, CTNES; Rye, Cahoon, Ali, & Daftary,

2008) and envy (Dispositional Envy scale, DES; Smith et al., 1999). Furthermore, we added a

three-item measure of envy for the experienced envy during the recalled episode. The CTNES

contains four subscales, three of which are about upward counterfactual thinking (how much

better things could have been) and one about downward counterfactual thinking (how much

worse things could have been). The upward scales further distinguish between counterfactuals

about what one did oneself, what another person did, or they do not refer to people. We

predicted that the three upward counterfactual scales would be related to both the amount of

envy felt in the specific situation and to dispositional envy. We thus expected that engaging

more in counterfactual thinking for a negative event would lead to more envy in that event,

but it would also be related to having a higher dispositional tendency to experience envy.

We again aimed for 300 participants (95% power for detecting a .20 correlation),

recruited via Amazon MTurk (U.S. based participants with a > 95% acceptance rate) and

received $0.40 for a 4-5 minute survey. We got 311 (176 males, 134 females, 1missing value;

M_{age} = 31.82 years, *SD* = 10.36, range 18-73) who completed it.

Participants were again asked to recall a situation in which someone else was better off

than they were in a domain rather important to them. After this, they received the CTNES, our

three-item envy scale, and the DES. The CTNES contains four subscales that have four items

each. Each item is a statement to which participants indicate how often they feel or think that

way when thinking back about a negative event they had just described (on a scale from 1

never to 5 *very often*). The four subscales are Non-Referent Upward (e.g., I think about how

much better things could have been), Self-Referent Upward (e.g., I think about how much

better things could have been if I had acted differently), Other-Referent Upward (e.g., If only

other people (or another person) would have acted differently, this situation would have never

happened), and Non-Referent Downward (e.g., I think about how much worse things could

have been). The Situational Envy scale consisted of three items related to the experienced

envy in the recalled situation (Did you feel a little envious of the person who was better off?,

Did you feel jealous of the person who was better off?, and Did you feel frustrated that the

other was better off than you were?, 0 *not at all*; 6 *very much so*). Finally, Dispositional Envy

was measured with the eight items of the scale (e.g., I feel envy every day, 1 *strongly

disagree*; 5 *strongly agree*).

Table 1 contains the reliability, mean, and standard deviation for each construct we

measured, as well as the correlation between them. We found that the more participants

engaged in upward counterfactual thinking regarding the recalled event, the more they had

experienced envy. We found this for all three subscales that measured upward counterfactual

thinking: so regardless of whether people had counterfactual thoughts that the situation would

have been better for them if they had done something differently, if the other had done

something differently, or without specifying others, the more they had these counterfactual thoughts the more they experienced envy. The same pattern was found for the dispositional measure of envy. As we had also expected, the tendency to make downward counterfactuals (thinking about things could have been worse) was unrelated to both situational and dispositional envy. To summarize, we replicated the relationship between counterfactual thinking and envy of Study 1, with different measures.

Study 3

In Study 3 we again examined the relationship between counterfactual thought and the intensity of envy. This time we asked participants to imagine being in a situation that was likely to elicit envy and indicate what they would think and feel in that situation. We also added a counterfactual closeness manipulation (see Roese, 1997). We predicted that the closer the participants had been to the outcome, the more they would have counterfactual thoughts, and the more intense their envy would be.

Furthermore, we manipulated the domain in which the target other was better off, by making it more (or less) important to the participant compared to the control condition. As we discussed in the introduction, more important domains and more similarity to the envied person typically lead to more intense envy, and we wanted to explore whether these factors would also affect the extent to which people entertained the counterfactual thought "it could have been me".

Method

Participants. Participants were recruited via Amazon MTurk and they received $0.15 for a 1.5 minute survey. We aimed for 100 participants per condition (as we were unsure how large expected effects of the manipulations were) and eventually had 505 participants in our 5 conditions (319 males and 186 females; M_{age} = 29.64 years, SD = 9.49, range 18-71). Although we set our survey program to assign participants randomly to the conditions, for

unknown reasons we ended up with an unequal distribution, with $n = 85$ to 127 per condition.

There were two missing values on the counterfactual question, and five on the envy question.

Control condition. In the control condition ($n = 98$), participants were asked to

imagine being in the following situation:

> Imagine that you have been working at a job as a junior sales representative for two years. You are enjoying your work, but you also hope that within the next year or so you can make a promotion to senior sales representative. This will make your job even more challenging, gives you more responsibility, and you will make more money as well.

> In your organization, once every half a year or so a junior sales representative is being promoted to a senior function. So, if someone gets a promotion, it takes a while before the next promotion will be possible again.

> The current buzz at work is that for the next upcoming promotion, it might be you or your colleague who is likely to be promoted. Your colleague works at the organization about equally long as you do, and your sales performance is similar as well.

> If the manager indeed needs to choose between the two of you, there does not seem to be a strong reason to favor one over the other.

> When the manager announces the promotion, it appears that the other has been chosen and that you missed this chance.

After participants read this scenario, they indicated how much they would have

thought "it could have been me" in that situation (0 *not at all*; 10 *very much so*). Next, they

indicated (on the same scale) if they would have felt "a little jealous." We asked for jealousy

instead of envy, because in the colloquial use of the English language people typically use the

word jealous to refer to the experience of envy (Smith, Kim, & Parrott, 1988). We wanted to

see whether we also find the correlation with counterfactual thinking when assessing envy this

way. "[3]

In addition to the control condition, there were four conditions that examined the

effects of Closeness to Outcome (close vs. far) and Domain Importance (more vs. less). Note

that this was not a full-factorial design, as we were not interested in interactions between

these two manipulations. We expected that a manipulation that brought the participant closer

to obtaining the outcome the other person had would increase counterfactual thinking (and thus envy) compared to the control condition, while a manipulation that made the participant farther away from the outcome would reduce counterfactual thinking (and thus envy). For the manipulation of Domain Importance we expected that in more important domains (compared to the control condition) participants would feel more envy, but also engage in counterfactual thinking more. If the domain was made less important, we expected less envy and counterfactual thinking than in the control condition. The conditions are described below.

Closeness. Two conditions were created that manipulated how close the participant was to the outcome. Compared to the Control condition, we added one sentence after the one that read that there was no strong reason to favor the participant or the other. In the Closer to Outcome condition ($n = 127$) we added the sentence "They then typically choose the person who works there longest, which is you." In the Farther from Outcome condition ($n = 108$) we added "They then typically choose the person who works their longest, which is the other."

Domain Importance. Two conditions were created that manipulated how important the domain was to the participant. Compared to the Control condition, we added two sentences after the part that described that their performance was similar to that of the other. In the Domain Important condition ($n = 85$) we added "Of course you hope you will make the promotion, but this time it is of particular importance to you. You need to make extra money to be able to support your family, you need more challenge to really keep liking your job, and due to the recession it is unclear whether there will be room to promote someone again in half a year." In the Domain Unimportant condition ($n = 87$) we added "Of course you hope you will make the promotion, but is not of particular importance to you. You make enough money to support your family, you like your job, and there will be another chance for a promotion in half a year."

Results

First, across conditions participants clearly engaged in counterfactual thinking ($M =$ 7.74, $SD = 2.19$) and they would feel jealous towards the person who received the promotion ($M = 6.57$, $SD = 2.57$). We replicated the finding of Studies 1 and 2 and found a strong association between counterfactual thinking and felt envy across all conditions, $r(498) = .46$, $p < .0001$. Table 2 contains the means and standard deviations for these dependent variables per condition. For both counterfactual thinking, $F(4, 495) = 25.59$, $p < .0001$, $\eta_p^2 = .17$, and for envy, $F(4, 495) = 9.43$, $p < .0001$, $\eta_p^2 = .07$, there were clear differences between conditions. Below we compare the effects of the manipulations Closeness to Outcome and Domain Importance (compared to the Control condition) separately.

Closeness. As Table 2 shows, there was a clear effect of the manipulation of closeness to the outcome on the counterfactual thought "it could have been me", $F(2, 328) = 42.11$, $p < .0001$, $\eta_p^2 = .20$. Examination of the means (all post hoc tests in this manuscript are LSD tests) revealed that all three conditions differ significantly from each other (p's $\leq .016$), and confirmed that those who were farther away from obtaining the outcome for themselves engaged in counterfactual thinking the least, while those who were closer to the outcome engaged in counterfactual thinking the most.

A similar effect was found for felt envy, $F(2, 327) = 9.62$, $p < .0001$, $\eta_p^2 = .06$. Post hoc analyses confirm that also here the participants who were farther away from getting the outcome themselves were least envious (p's $\leq .022$), while those who were closer to obtaining the outcome experienced the most envy. Note that for this latter comparison the Close to Outcome condition compared to the Control condition, was marginally significant at $p = .059$. The general pattern is thus clear that the closer someone was to an outcome that another person obtained, the more feelings of envy arose.

We predicted that being closer to an outcome would increase the counterfactual thinking, which would then increase felt envy. To test this we conducted a bootstrapping

mediation analysis (Preacher & Hayes, 2008) with 10000 samples and bias corrected

intervals. Figure 1 displays a summary of the results. The Closeness manipulation (Far from

Outcome condition coded as 0, Close to Outcome as 1) had an effect on the proposed

mediator counterfactual thoughts, $b = 2.47$, $se = 0.27$, $t = 9.25$, $p < .0001$. The effect of the

manipulation on envy, $b = 1.46$, $se = 0.34$, $t = 4.28$, $p < .0001$, became insignificant, $b = 0.32$,

$se = 0.37$, $t = 0.85$, $p = .394$, when the effect of the counterfactual thinking on envy, $b = 0.46$,

$se = 0.08$, $t = 5.86$, $p < .0001$, was taken into account. This indirect (mediating) effect was

significant as the 95% confidence interval did not include 0 (CI: 0.72 to 1.66).

Domain Importance. Our data confirmed the earlier findings that domain importance

is an important antecedent for envy (see Table 2), as the manipulation clearly affected felt

envy, $F(2, 265) = 9.58$, $p < .0001$, $\eta_p^2 = .07$. Participants in the Domain Unimportant

condition felt less envious than those in the Control and Domain Important conditions (p's ≤

.006). Participants in the Domain Important condition felt (marginally significantly, $p = .086$)

more envy than those in the Control condition. The general pattern is thus clear that the more

important a domain is to a person, the stronger the felt envy will be if another person is better

off.

Confirming our ideas, we also found that the manipulation of Domain Importance

affected how much participants engaged in counterfactual thinking, $F(2, 267) = 3.91$, $p <

.021$, $\eta_p^2 = .02$ (see Table 2). Participants in the Domain Unimportant condition engaged in

less counterfactual thinking compared to those in the Domain Important condition, $p = .006$.

How much participants in the Control condition engaged in counterfactual thinking fell in

between these two conditions as we had predicted, but was not significantly different from the

Domain Unimportant condition, $p = .147$, nor the Domain Important condition, $p = .154$. The

general pattern is clear, however: the more important a domain is to oneself in which another

person is better off, the more a person engaged in counterfactual thinking.

We predicted that a part of the effect of Domain Importance on envy would be mediated by the increase in counterfactual thoughts. To test this we again conducted a similar bootstrapping mediation analysis as before. Figure 1 displays a summary of the results. The Domain Importance manipulation (Domain Unimportant condition coded as 0, Domain Important as 1) had an effect on the proposed mediator counterfactual thoughts, $b = 0.87$, $se = 0.29$, $t = 2.97$, $p = .004$. The effect of the manipulation on envy, $b = 1.60$, $se = 0.37$, $t = 4.29$, $p < .0001$, became less strong, $b = 1.02$, $se = 0.33$, $t = 3.12$, $p = .002$, when the effect of the counterfactuals on envy, $b = 0.67$, $se = 0.08$, $t = 8.02$, $p < .0001$, was taken into account. This indirect (mediating) effect was significant as the 95% confidence interval did not include 0 (CI: 0.21 to 1.02).

Discussion

We replicated the finding from Study 1 that entertaining the counterfactual thought "it could have been me" was strongly correlated with feelings of envy. Moreover, a manipulation of closeness to the outcome increased both counterfactual thinking and envy. The effect of being closer to obtaining the outcome for oneself on the intensity of envy was mediated by counterfactual thinking. Furthermore, a manipulation known to influence envy (domain importance) did indeed influence envy in our study, but we also found that it increased counterfactual thinking. The effect of domain importance on envy was partially mediated by counterfactual thinking.

Study 4

The goals of Study 4 were similar to those of Study 3, but instead of using a scenario methodology we used recalled life events (as in Studies 1 and 2). We again manipulated counterfactual closeness and domain importance.

Method

Participants were recruited via Amazon MTurk and received $0.45 for a 4.5 minute

survey. We again aimed for 100 participants per condition and eventually had 380 participants

for our four conditions (253 males, 126 females, 1unknown; M_{age} = 28.22 years, SD = 9.51,

range 18-66).

Participants were asked to remember a situation in which someone else was better off

(as in Study 1). We created four conditions (two sets of two conditions). Note that this was

not a full-factorial design, as we were not interested in interactions between these two

manipulations. The first was that we asked participants to recall a situation in which they felt

they were close to obtaining the better outcome the other had: "Try to recall a situation in

which you felt that you had been very close to getting that better outcome for yourself, and

that you felt that you almost reached it" (Close to Outcome condition, n = 95) or for which

they felt they had little chance to obtain that outcome (Far from Outcome condition, n = 94).

A second manipulation was that we either asked them to remember an instance in which the

domain they were outperformed was very important to them (Important condition, n = 96) or

not very important to them (Unimportant condition, n = 95).

After participants recalled an envy experience, we first administered manipulation

checks. We asked them to indicate how much they agreed with the following statements (0

not at all; 10 *very much so*): "The domain in which the other person was better off was

important to me" (domain importance) and "I felt I had been close to obtaining the better

outcome for myself" (closeness). After this we asked for counterfactuals ("How much did you

think *it could have been me?*") and envy ("I felt a little envious of the other") as in Study 1.

Results

We analyzed the data in two ways. First, we collapsed across conditions and tested the

effects of the measures that dealt with the situational circumstances of the recalled episode

(closeness to outcome and domain importance) on the counterfactual thoughts and envy.

Second, we tested the separate effects of the two manipulations on counterfactuals and envy.

Effects across conditions. The mean responses to the variables across the four conditions and the correlations between these variables can be found in Table 3. Replicating the findings of Studies 1 and 2, the more participants entertained the counterfactual thought "it could have been me", the more they experienced envy, $r(378) = .43$, $p < .0001$. Furthermore, the correlations revealed that the measures of how close one was to obtaining the outcome oneself and the importance of the domain in which the other were better off were significantly associated with the counterfactual thought of "it could have been me" and the experienced envy.

We replicated the mediation we had found in Study 3 of the effect of closeness to the outcome and domain importance on envy via counterfactual thinking using a similar method. Figure 1 contains a graphical display of these analyses. We again found that the closer a person felt to obtaining the outcome for oneself, the more they engaged in counterfactual thinking (the proposed mediator), $b = 0.67$, $se = 0.04$, $t = 16.81$, $p < .0001$. The effect of closeness to the outcome on envy, $b = 0.27$, $se = 0.05$, $t = 5.79$, $p < .0001$, disappeared, $b = 0.01$, $se = 0.06$, $t = 0.13$, $p = .897$, when the effect of the counterfactuals on envy, $b = 0.39$, $se = 0.06$, $t = 6.90$, $p < .0001$, was taken into account. This indirect (mediating) effect was significant as the 95% confidence interval did not include 0 (CI: 0.19 to 0.34).

For domain importance, a more important domain of social comparison led to more counterfactual thinking (the proposed mediator), $b = 0.44$, $se = 0.05$, $t = 9.21$, $p < .0001$. The effect of domain importance on envy, $b = 0.58$, $se = 0.04$, $t = 14.68$, $p < .0001$, became less strong, $b = 0.49$, $se = 0.04$, $t = 11.61$, $p < .0001$, when the effect of the counterfactuals on envy, $b = 0.19$, $se = 0.04$, $t = 4.76$, $p < .0001$, was taken into account. This indirect (mediating) effect was significant as the 95% confidence interval did not include 0 (CI: 0.05 to 0.14). Note that a sizeable effect of domain importance on envy did remain.

Effects of the manipulations. The analyses reported so far in Study 4 dealt with the relationship between variables and had collapsed the results across all the conditions. In the subsequent section we discuss the results for each of the two manipulations, Closeness to Outcome and Domain Importance. Means and standard deviations for all variables per condition are presented in Table 4.

Closeness to outcome. As Table 4 shows, the manipulation of closeness influenced how close people felt to the outcome, $t(187) = 8.35$, $p < .0001$, $d = 1.21$. Importantly, participants who were asked to recall a situation in which they had been close to obtaining the outcome that the other person had (compared to having been quite far from the outcome themselves), had more thoughts of "it could have been me", $t(187) = 6.23$, $p < .0001$, $d = 0.90$. There was, however, this time no significant effect of this manipulation on envy, $t(187) = 0.93$, $p = .352$, $d = 0.14$.

Note that although there was no significant effect of this manipulation on envy, there can still be an indirect effect. If the independent variable influences a mediator variable and that mediator variable influences a third variable, there is an indirect effect regardless of whether the path of the independent variable to the third variable itself is significant (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). In the mediation analysis we again found that the closer a person felt to obtaining the outcome for oneself, the more they engaged in counterfactual thinking (the proposed mediator), $b = 1.47$, $se = 0.24$, $t = 6.22$, $p < .0001$. The non-significant effect of closeness to the outcome on envy, $b = 0.21$, $se = 0.22$, $t = 0.94$, $p = .352$, became, $b = -0.13$, $se = 0.24$, $t = 0.54$, $p = .589$, when the effect of the counterfactuals on envy, $b = 0.23$, $se = 0.07$, $t = 3.42$, $p = .0008$, was taken into account. Although there was thus not a significant effect of the manipulation of closeness to the outcome in this study , there was an indirect (mediating) effect via counterfactuals as the 95% confidence interval did not include 0 (CI: 0.12 to 0.63). The mediation is graphically depicted

in Figure 1.

Domain importance. As Table 4 shows, the manipulation of domain importance influenced the manipulation check for domain importance, $t(189) = 12.52$, $p < .0001$, $d = 1.81$. Note that it also had an unexpected effect on how close participants had felt being to the outcome, $t(189) = 5.21$, $p < .0001$, $d = 0.76$. As expected, in more important domains participants had experienced more envy than in unimportant domains, $t(189) = 7.72$, $p < .0001$, $d = 1.11$, and they had also thought more "it could have been me", $t(189) = 6.14$, $p < .0001$, $d = 0.89$. The manipulation of domain importance thus influenced both envy and counterfactual thoughts, which we had also found in Study 3.

In the mediation analysis we again found that a manipulation that made the domain of comparison in which the other was better off more important increased counterfactual thinking (the proposed mediator), $b = 1.66$, $se = 0.27$, $t = 6.14$, $p < .0001$. The effect of domain importance on envy, $b = 1.90$, $se = 0.25$, $t = 7.72$, $p < .0001$, became less strong, $b = 1.30$, $se = 0.25$, $t = 5.24$, $p < .0001$, when the effect of the counterfactuals on envy, $b = 0.36$, $se = 0.06$, $t = 5.92$, $p < .0001$, was taken into account. The indirect effect confirms that this partial mediation is significant as the 95% confidence interval did not include 0 (CI: 0.35 to 0.94). The mediation is graphically depicted in Figure 1.

Discussion

We again replicated the correlation between the counterfactual thought "it could have been me" and felt envy across all conditions. Furthermore, we also replicated the finding of Study 3 that the perception of being close to the outcome that the envied person had obtained influenced envy, and this effect was mediated by counterfactual thoughts. The manipulation for the closeness of the outcome also led to more counterfactual thoughts, but not directly to significantly more envy. However, there was still an indirect effect (and thus a mediation) of the manipulation on envy via counterfactual thoughts. These results are consistent the idea

that counterfactual thinking increases the intensity of envy. For both the manipulation and the measure of domain importance, we again found that more important domains made people more envious and made them think the counterfactual thought "it could have been me" more.

General Discussion

Based on Frijda's (1988) law of comparative feeling and earlier theorizing about envy (Ben Ze'ev, 1992; Coricelli & Rustichini, 2010; Elster, 1991), we predicted that the more people would think "it could have been me", the more they would be envious. In four studies we found that counterfactual thinking is related to the intensity of envy. A meta-analysis across all correlations between counterfactual thinking and envy in our studies showed that the correlation between counterfactual thinking and envy across the studies was $r = .40$, with a 95%CI of .36 to .45.[4]

Furthermore, in Study 3 we found that a manipulation known to influence counterfactual thoughts (being closer to the desired outcome) influenced envy, and this effect was mediated by counterfactual thoughts. Although we did not find a significant direct effect of a similar manipulation of closeness to the outcome on envy in Study 4, we did find the same indirect effect that the manipulation that made participants feel that closer to the outcome that the envied person had increased counterfactual thinking, which in turn increased the intensity of envy. Based on these findings, we thus conclude the counterfactual thought "it could have been me" is clearly associated with the experience of envy.

In our view, the relationship between envy and counterfactual thinking resembles the situation of regret, where the cognitive aspects of counterfactual thinking and the emotional experience of regret are intertwined (Zeelenberg et al., 1998). The thought "it could have been me" is likely to be both an appraisal of a situation that triggers feelings of envy, as well as a consequence from the experience of envy that helps people focus on ways to improve (see also Elster, 1991). Counterfactual thinking helps people to learn and improve their decisions

in future situations (Markman, Gavanski, Sherman, & McMullen, 1993; Roese, 1994).

Coricelli and Rustichini (2010) indeed argue that envy helps people to adapt and learn from

prior decisions. To be able to fulfill this learning goal effectively, it would be logical if envy

also elicits counterfactual thoughts to help to determine where one can improve to obtain the

desired outcomes for oneself. Although we think an effect of envy on counterfactual thinking

is likely to exist, our current data seem more supportive of the counterfactual to envy link then

for the envy to counterfactual link. In our Studies 3 and 4 we found mediation of the effect of

being close to an outcome on envy via counterfactual thinking. If we test these analyses with

envy as the mediator and counterfactual thinking as the dependent variable, the indirect

mediating effect is significantly smaller in all three analyses (but it is significant in two of the

three tests). Details on these analyses can be found in Appendix B.

Consequences for our understanding of envy

The current research helps to make novel predictions about when envy is likely to be

more intense. If counterfactual thinking increases the intensity of envy, other factors that

increase counterfactual thinking are likely to lead to more envy as well. In general, the easier

it is to come up with alternative views of how the situation could have ended up (the more

"mutable" the situation is), the more people engage in counterfactual thinking (Kahneman &

Miller, 1986). Based on this idea, we will make some novel prediction on when envy is likely

to be more intense.

Control over the situation. Counterfactual thinking is stronger in situations in which

people feel they have control over the situation (Markman et al. , 1995; Roese, 1997). If

people feel a situation could not have been changed by oneself, counterfactual thinking does

not occur as much. For example, imagine a lottery in which either ticket A or B will win. In

one condition Player 1 gets to choose between two tickets and Player 2 receives the unchosen

ticket. In another condition Players 1 is randomly assigned a ticket as well. The perceived

control for Player 1 in the first condition will be higher than in the second condition, which we would thus predict to increase the intensity of envy if Player 2 would win the lottery.

Envy and narcissism. The current findings also fit with recent work on the link between envy and narcissism. Narcissism and envy are often linked and one of the DSM-IV-TR criteria for diagnosing narcissism is actually whether a person is often envious (APA, 2000). An important distinction in types of narcissism is differentiating between *grandiose* and *vulnerable* narcissists. Both types have a high need to be admired and lack empathy, but grandiose narcissists have a very high self-confidence while vulnerable narcissists actually have a low self-esteem (Stoessel, 2007). Recent research found that only the vulnerable narcissists are more likely to be envious (Krizan & Johar, 2012). A possible reason for this is that grandiose narcissists see no reason to think "it could have been me" if they are confronted with someone who is better off than them, as a grandiose narcissist is likely to feel that he is better anyway and would thus not generate upward counterfactuals. Vulnerable narcissists, however, want to be admired, but because of their low self-esteem they need to find confirmation that they are actually in a position that elicits admiration in others. This likely makes them focus on their relative standing more than other people do, and thus more prone to thoughts like "it could have been me" and therefore envy. This prediction also fits with the idea that people with low-self esteem generally engage more in counterfactual thinking (Roese & Olson, 1993).

Conclusion

We empirically explored the relationship between counterfactual thinking and envy. Across four studies we find that the more someone thinks "it could have been me" when another person is better off, the more intense the associated envy is. The clear and consistent relationship helps to identify novel predictions regarding the experience of envy.

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Footnotes

1. Two participants had not recalled an episode of envy, as they had copied the assignment in the box instead of written down a personal story. There were two pairs of cases that came from the same IP address, and because it could be that someone created two MTurk accounts and filled out the questionnaire twice, we left these participants out of the analyses. We used these exclusion criteria in the other studies as well.

2. We had also added the Social Comparison Orientation (the INCOM, Gibbons & Buunk, 1999) for exploratory reasons. Unfortunately, we made a mistake with the scale labeling that prevented us from using the scale.

3. For exploratory reasons, we had also added questions on whether participants had thought "I wish I had received the promotion", had felt "a little frustrated" and had felt "happy for the other". Furthermore, in Study 3 and 4 we had added a manipulation of target similarity, which did not influence envy nor counterfactual thinking. We left those out of this manuscript. Note that also within those conditions, counterfactual thinking correlated with envy, Study 3 $r(175) = .43$, $p < .0001$, Study 4 $r(182) = .29$, $p < .0001$. Finally, Study 4 also contained a manipulation check for perceived similarity to the target other. The descriptive statistics of these variables and manipulations that were left out of this manuscript can be found in Appendix A.

4. We conducted the meta-analysis with the *metagen* package in the statistical software R. For Study 1, 3 and & 4 we used the correlation reported in that study. In Study 2 we had three measures of counterfactual thinking that we had expected to be related to envy (the upward counterfactual thinking scales). For this meta-analysis we took the average of the three upward counterfactual scales and correlated that average with envy ($r(308) = .32$, $p < .0001$). We also added the two correlations from the additional conditions reported in footnote 3, which gave us 6 correlations with a total sample size of 1826 participants.

Table 1. Descriptives and Correlations of the Counterfactual Thinking for Negative Events

Scales and Envy Measures in Study 2

CTNES		α	M	(SD)	C2	C3	C4	E1	E2
			Descriptives				Correlations		
C1	Non-Referent Upward	.84	2.97	(1.00)	.67***	.23***	.07	.49***	.46***
C2	Self-Referent Upward	.83	2.47	(1.04)		.32***	.20***	.31***	.44***
C3	Other-Referent Upward	.90	2.21	(1.17)			.08	.18**	.24***
C4	Non-Referent Downward	.89	2.56	(1.16)				-.01	.05
Envy									
E1	Situational Envy	.91	4.18	(1.54)					.40***
E2	Dispositional Envy	.87	2.27	(0.97)					

Note. CTNES & Dispositional Envy scales from 1 to 5, Situational Envy from 0 to 6. ** $p <$ .01, *** $p < .001$

Table 2. Counterfactual Thoughts and Envy in Study 3

Conditions	Counterfactual		Envy	
	M	(*SD*)	*M*	(*SD*)
Control	7.95	(2.04)	6.64	(2.36)
Close to Outcome	8.62	(1.70)	7.29	(2.54)
Far from Outcome	6.19	(2.42)	5.83	(2.64)
Domain Important	8.36	(1.68)	7.26	(2.30)
Domain Unimportant	7.53	(2.11)	5.66	(2.56)

Note. All questions were answered on scales from 0 *not at all* to 10 *very much so*.

Table 3. Mean Responses and Correlations across all Conditions in Study 4

		M	(SD)	Correlations		
				2	3	4
1	Close to Outcome	3.51	(1.90)	.36	.65	.29
2	Important	3.75	(1.87)		.43	.60
3	Counterfactual	3.79	(1.94)			.43
4	Envy	4.09	(1.79)			

Note. $N = 380$. Dependent variables were assessed on a scale from 0 *not at all* to 6 *very much so*. All correlations $p < .0001$.

Table 4. Mean Responses per Condition in Study 4

Manipulations	Close to Outcome		Important		Counterfactual		Envy	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Close to Outcome	4.69^b	(1.35)	4.05	(1.72)	4.84^b	(1.39)	4.61	(1.40)
Far from Outcome	2.72^a	(1.86)	4.14	(1.52)	3.37^a	(1.83)	4.40	(1.63)
Domain Important	3.97^b	(1.74)	4.77^b	(1.35)	4.29^b	(1.82)	4.61^b	(1.45)
Domain Unimportant	2.63^a	(1.81)	2.03^a	(1.66)	2.63^a	(1.92)	2.72^a	(1.92)

Note. Responses were given on scales from 0 = *not at all* to 6 = *very much so.* Means with a different superscript differ for that variable and that manipulation at $p < .05$.

Figure 1. Mediation Analyses Testing the Indirect Effect of Closeness to Outcome and Domain Importance on Envy via Counterfactual Thinking in Studies 3 and 4
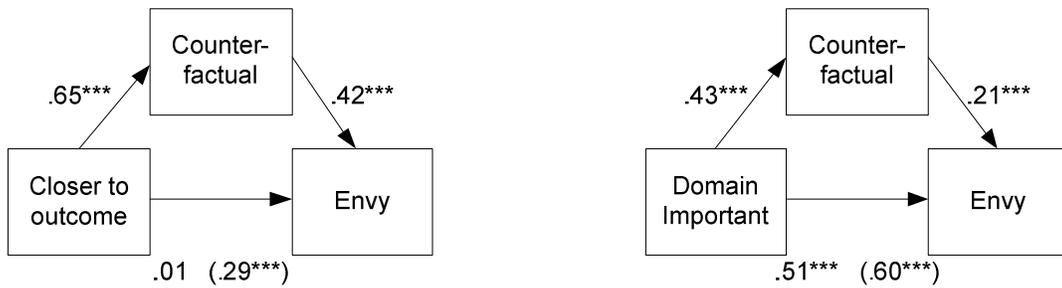
Study 2
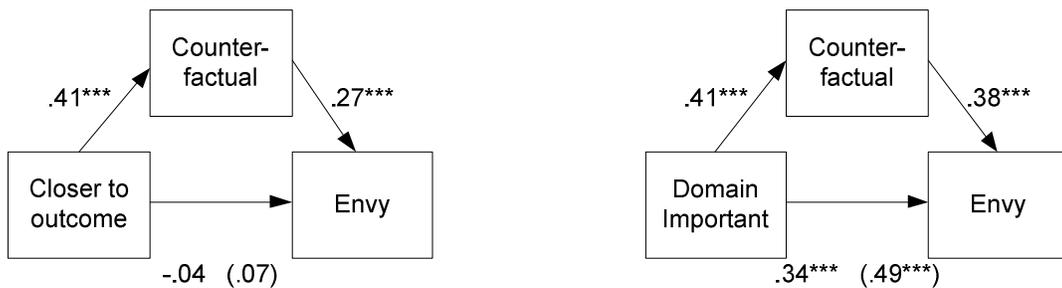Manipulations of closeness to outcome and domain importance
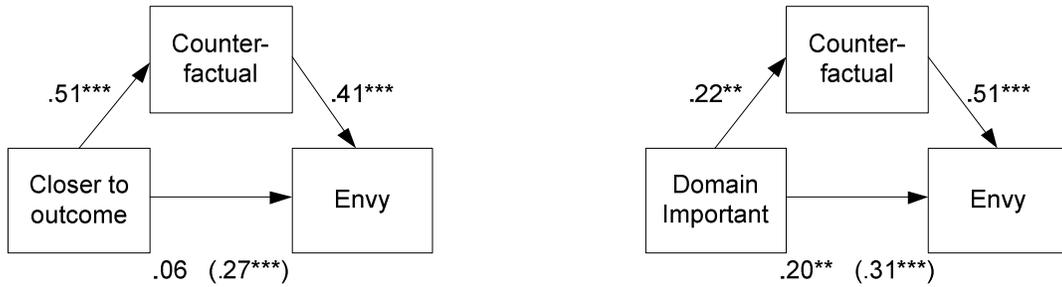
Study 3
Measures of closeness to outcome and domain importance

Study 3
Manipulations of closeness to outcome and domain importance

Note. All indirect effects are significant at $p < .05$.

Appendix A. Results on Manipulations and Variables Added for Exploratory Purposes

Study 3

We had also manipulated how similar the target person was to the participant (by varying gender of the target person). Compared to baseline (in which gender was not specified), we intended to create situations in which the superior other was of the other gender (creating more dissimilarity) or of the same gender (creating more similarity). Specifically, to create (dis)similarity we added gender information by either describing the other as Mark ($n = 91$) or Mary ($n = 86$). We later recoded these manipulations to indicate whether participants read about someone with the same gender (Similar condition, $n = 75$; 48 male, 27 female) or of the other gender (Dissimilar condition, $n = 102$; 59 male, 43 female).

First, also in these two conditions we found the correlation between counterfactual thinking and felt envy, $r(175) = .43$, $p < .0001$. Second, the manipulation of target similarity (Less Similar / Control / More Similar), did not affect counterfactual thinking or envy, F's$(2, 272) \leq 0.17$, p's $\geq .842$, η_p^2's $\leq .01$ (counterfactual thinking $M_{Less\ Similar} = 7.82$, SD $= 2.18$, $M_{Control} = 7.95$, SD $= 2.04$; $M_{More\ Similar} = 8.00$, SD $= 2.05$; envy $M_{Less\ Similar} = 6.57$, SD $= 2.18$, $M_{Control} = 6.64$, SD $= 2.36$; $M_{More\ Similar} = 6.56$, SD $= 2.43$).

Furthermore, we had added three questions for which we wanted to explore the effect of the manipulation on these variables. These were measures for *Desire* (I wish I had received the promotion), *Frustration* (I would feel a little frustrated), and *Happy for Other* (I would feel happy for the other). The means and standard deviations per condition on these measures can be found in Table A1. For both desire, $F(6, 674) = 16.81$, $p < .0001$, $\eta_p^2 = .13$, and frustration, $F(6, 673) = 17.11$, $p < .0001$, $\eta_p^2 = .13$, there were significant effects of the manipulations. For being happy for the other there was no effect of the manipulations, $F(6, 669) = 0.96$, $p = .454$, $\eta_p^2 = .01$. For details of which conditions differ from each other, see also Table A1.

Table A1. Desire, Frustration, and Being Happy for the Other per Condition in Study 3

Conditions	Dependent Variables					
	Desire		Frustration		Happy for Other	
	M	(SD)	M	(SD)	M	(SD)
Control	8.68[b]	(1.79)	6.84[b]	(2.46)	5.75	(2.29)
Closer to Outcome	9.16[ab]	(1.26)	7.94[a]	(2.25)	5.16	(2.30)
Farther from Outcome	8.14[c]	(2.16)	5.36[c]	(2.66)	5.70	(2.49)
Domain More Important	9.27[a]	(1.41)	7.75[a]	(2.30)	5.29	(2.57)
Domain Less Important	6.92[d]	(2.58)	5.35[c]	(2.76)	5.67	(2.60)
Other More Similar	8.65[bc]	(2.04)	6.77[b]	(2.71)	5.30	(2.67)
Other Less Similar	8.82[ab]	(1.70)	6.82[b]	(2.44)	5.60	(2.40)

Note. All questions were answered on scales from 0 = *not at all* to 10 = *very much so*. Means with a different superscript differ at $p < .05$, tested with LSD post hoc tests.

Study 4

Although we had not found an effect of how similar one was to the target person in Study 3, we added this manipulation in Study 4 as well. The manipulation was that we asked participants to either recall someone who was better off than them who was initially similar to them: "Try to recall a situation in which the person who you describe was rather similar compared to you, before (s)he became better off. For example, the person had a similar background, was from the same place as you are, had a similar educational background, etc." (Similar Other condition, $n = 94$) or someone who was initially not very similar to them (Dissimilar Other condition, $n = 90$). As a manipulation check, we had included the question "Before the other was better off, we were rather similar", on the same scale as the other

questions (0 *not at all*; 10 *very much so*). Also within these two conditions, we again found

the correlation between counterfactual thinking and envy, $r(182) = .29$, $p < .0001$. As Table

A2 shows, the manipulation of similarity to the target person only influenced the

manipulation check of similarity, but not any of the other variables. The measure of similarity

did not differ significantly for the manipulations of domain importance and closeness to the

outcome.

Table A2. Effects of Similarity Manipulation in Study 4

	Condition				Statistics		
	Less Similar		More Similar				
	M	(SD)	M	(SD)	$t(182)$	p	d
Counterfactual	3.80	(1.96)	3.95	(1.74)	0.54	.591	0.08
Envy	4.51	(1.55)	4.10	(1.59)	1.80	.074	0.27
Similarity	2.58	(1.85)	4.60	(1.42)	8.32	< .001	1.23
Domain Importance	3.81	(1.79)	3.84	(1.49)	0.12	.904	0.02
Closeness to Outcome	3.34	(1.91)	3.41	(1.71)	0.26	.792	0.04

Appendix B. Tests of Mediation of Effect of Closeness to the Outcome on Counterfactual Thinking via Envy

  Study 3, manipulation of closeness . The effect of the closeness manipulation influenced envy via counterfactual thinking. A test of mediation in the other direction, (the effect of the manipulation on counterfactuals via envy), revealed a significant indirect effect. The initial effect of the manipulation of closeness to the outcome on counterfactual thoughts, $b = 1.23$, $se = 0.13$, $t = 9.11$, $p < .0001$, becomes less strong, $b = 1.01$, $se = 0.13$, $t = 7.83$, $p < .0001$, when the effect of envy was taken into account. The indirect effect (CI: 0.10 to 0.37) was clearly less strong compared to the mediating effect of counterfactual thinking on envy (CI of the indirect effect was 0.36 to 0.77).

  Study 4, measure of closeness. The effect of the measure of perceived closeness to outcome influenced envy via counterfactual thinking. Testing the mediation in the other direction, (the effect of the manipulation on counterfactuals via envy), the analyses revealed a significant indirect effect. The initial effect of the measure of closeness on counterfactual thoughts, $b = 0.67$, $se = 0.04$, $t = 16.81$, $p < .0001$, became less strong, $b = 0.59$, $se = 0.04$, $t = 15.11$, $p < .0001$, when the effect of envy was taken into account. The indirect effect (CI: 0.04 to 0.12) was clearly less strong compared to the mediating effect of counterfactual thinking on envy (CI of the indirect effect was 0.18 to 0.34).

  Study 4, manipulation of closeness. The effect of the closeness manipulation influenced envy via counterfactual thinking. Testing the mediation in the other direction, (the effect of the manipulation on counterfactual thought via envy), the analyses revealed no significant indirect effect (CI: - 0.05 to 0.21). There was mediation of the closeness manipulation via counterfactual thinking on envy (of which the CI of the indirect effect was 0.12 to 0.63).