Imagined empathy and anger intensity: Distinct emotional implications of perceiving that a close versus distant other is privy to an anger-inducing experience

Jacquie D. Vorauer and Corey Petsnik

University of Manitoba

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Abstract

Simply as a function of being there to witness an anger-inducing event, hearing about it afterwards, or being on the receiving end of a text, email, or online post about it, can another person change individuals' affective and behavioral reactions to what happened? The present research tested the hypothesis that whereas perceiving a psychologically close other as witness to what happened intensifies individuals' angry reactions, perceiving a psychologically distant other such as an outgroup member as witness instead has an attenuating effect. We further tested a purely intrapersonal pathway through which these effects might arise, one that centers on the distinct levels of empathy that individuals imagine that close versus distant others feel for them. Results of five experiments were broadly consistent with predictions. These results were obtained across operationalizations of psychological closeness in terms of personality and values similarity (Experiments 1 and 2), demographic similarity (Experiments 3 and 4), and type of relationship (Experiment 5), across highly impactful recalled anger-inducing experiences (Experiments 1 to 4) and a minor event staged in the lab (Experiment 5), and across ostensible witnesses encountered in online exchanges (Experiments 1 to 4) and real witnesses who were physically present as observers (Experiment 5). Taken together, the findings point to the possibility of individuals creating "echo chambers" all by themselves that do not depend on any actual external validation or support and also suggest that outgroup audiences may sometimes have affective implications that parallel those stimulated by adopting a distanced perspective on the self.

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People often encounter circumstances in their everyday lives that trigger strong emotions. Fueled by a desire for support and validation or any of a wide variety of other motives, one of the first things that individuals do in the wake of such experiences is seek out a friend or romantic partner to tell about it (e.g., Rimé, 2009).

At the same time, research reveals that close others can act in ways that intensify individuals' affective reactions to negative events. For example, when individuals disclose a conflict from outside the dyad to their romantic partner, their partner may engage in negativityvalidating behavior that is detrimental to individuals' motivations toward and evaluations of the third-party adversary (Lemay, Ryan, Fehr, & Gelfand, 2020). More generally, the empathic reactions of a close other can intensify individuals' reactions to emotionally and physically painful experiences (Hurter, Paloyelis, Williams, & Fotopoulou, 2014; Nils & Rimé, 2012).

In the present research we probe a novel and purely intrapersonal pathway through which other people can affect the intensity of individuals' affective reactions to their experiences. We focus specifically on the case of anger, for which intensification may have serious negative interpersonal consequences involving, for example, online incivility and aggression. Our main hypothesis was that, as a function of the distinct levels of empathy that individuals imagine receiving from psychologically close versus distant others, perceiving a psychologically close other as witness to an anger-inducing event would intensify individuals' feelings of anger about what happened, whereas perceiving a psychologically distant other as witness would instead have an anger-attenuating effect.

Imagined empathy: Witnesses as anger intensifiers

Individuals' preoccupation with others' reactions to them and readiness to see themselves as the focus and target of others' thoughts and feelings is well-documented (e.g., Leary & Downs, 1995; Zuckerman et al., 1983). This egocentrism, combined with the role of perceived empathy and validation in reinforcing negative affect, raises the possibility that merely perceiving another person as witness to an event might enhance individuals' emotional reactivity - regardless of whether the other person actually exists or knows about what happened. Specifically, individuals' own conjurings of the other person's internal reactions to their experience could trigger *imagined empathy* that reinforces and exacerbates negative feelings, irrespective of what the other person says or does. Merely as a function of being perceived as privy to the event – perhaps by being present, but alternatively by hearing about it afterwards or being on the receiving end of a text, email, or online post – the other person may be a stimulus for thinking about the experience in a way that reinforces individuals' initial feelings and renders them more extreme. In the case of an anger-inducing event, imagining another's empathy for them and thoughts about an injustice they were done may lead individuals to generate more negative cognitions about it than they otherwise would have and thereby "fan the flames" of their anger, in a manner somewhat akin to self-generated attitude change (Tesser, 1978) but with a distinctly social dimension. Given that individuals' imaginings do not depend on anything their audience actually says or does, it is in a sense a case of individuals creating an "echo chamber" all by themselves, and one that does not depend on any actual external validation or support from others. It thereby represents a very intrapersonal version of interpersonal emotion regulation (Rimé, 2007; Zaki & Williams, 2013).

What exactly might such imagined empathy involve? Two key possibilities were of particular interest in the present research. First, individuals might perceive that an audience identifies with and feels the same feelings that they are, which would involve feeling anger on their behalf when an anger-inducing event is witnessed. Alternately or in addition, they might perceive that a sympathetic audience who witnesses the event will feel concerned for their plight. These perceptions map directly onto the constructs of parallel and reactive empathy that have previously been identified and empirically examined (see, e.g., Stephan & Finlay, 1999). In line with these definitions, we could use the terms imagined emotional resonance and imagined sympathy to refer to these perceptions. However, we refer to them instead as imagined parallel and reactive empathy so as to be consistent with terms that have been used in previous research and to capture how they share a common focus on individuals' imaginings of the extent to which an audience is "feeling for" them, in one way or another.

Can psychologically distant witnesses instead serve as anger attenuators?

Notably, the dynamic whereby imagined empathy intensifies feelings of anger should hinge critically on individuals perceiving the other person to be close to them in some way, even if merely by dint of similarity. Much like how individuals' own empathy for someone else is strongly tied to how close they feel to the person, individuals may be more inclined to imagine empathy from psychologically close than distant others. Further, and in line with how in intergroup interaction contexts individuals readily envision that an outgroup member might view them as having traits that contrast with they view themselves (Vorauer, Main, & O'Connell, 1998), another person who is distant from them may stimulate broader perspective-taking on the self that leads individuals away from, rather than towards, intense emotions: When a different other or an outgroup member is privy to an emotionally impactful experience, imagining the person's affective neutrality and indifference and seeing the experience as the person (ostensibly) sees it may reduce the intensity of individuals' own reactions.

There would seem to be potential parallels here to the literature on self-distancing, which identifies how considering an experience from a more distant point of view can have beneficial implications for coping (e.g., Kross & Ayduk, 2008). An anger-attenuation effect would also fit well with research indicating that diversity in working groups can be associated with more complex and thorough information processing (e.g., Antonio et al., 2004) and that intergroup contact experiences can facilitate "deprovincialization" or reappraisal of the ingroup (Pettigrew, 1998). Further, such a finding would point to a previously unappreciated potential benefit of diverse social environments for emotion regulation and broadly complement research showing the mood-boosting effects of talking to distant others such as total strangers or weak social ties (e.g., Epley & Schroeder, 2014; Sandstrom & Dunn, 2014).

The present work probing the effects of merely having an experience witnessed by others also complements recent research documenting how co-experiencing sensory stimuli with others affects the intensity of those experiences (Boothby, Clark, & Bargh, 2014; Boothby, Smith, Clark, & Bargh, 2016, 2017). However, the focal phenomenon here, involving others as witnesses only, does not rest on others actually having the same experience. Rather, it relies on a specific type of mentalizing that involves imagining another's reactions to oneself and one's personal experiences. This form of mentalizing is more egocentric than the broader empathic processes implicated in research on co-experience but certainly could occur in the context of coexperience as well.

Our key theoretical contributions are to introduce the construct of *imagined empathy* to capture individuals' perceptions of another person's emotional stance toward them and to

demonstrate the implications of these perceptions for the intensity of individuals' emotional and behavioral reactions to potentially anger-inducing events. We highlight in particular how these perceptions can be dictated by the other's perceived similarity or relational closeness to the self and how individuals can form and be affected by these perceptions even in the absence of receiving any cues whatsoever from the other person.

Overview

We present five experiments probing the overarching hypothesis that people have more intense reactions to an anger-inducing event as a function of perceiving a psychologically close other to be aware of what happened, but less intense reactions as a function of perceiving that the event is witnessed by someone who is psychologically distant from them. In Experiments 1 to 4, the intensity of individuals' feelings about an experience that had made them angry were assessed after they learned that someone who was either similar or dissimilar to them either would or would not read a description of the event that they had written. Experiment 5 examined reactions to a minor anger-inducing event: Individuals experienced a gambling loss or gain in the laboratory in front of a friend or stranger and then reported how angry they were feeling. Across the experiments, process measures focused on imagined reactive and parallel empathy and a variety of potential downstream behavioral implications of individuals' angry feelings were also assessed.¹

To streamline our presentation, Experiments 1 to 4, which are very methodologically similar, are presented meta-analytically. We first describe the common methodology across these

¹ The present paper includes all of the relevant studies that we have conducted examining the effects of psychologically close versus distant witnesses on individuals' feelings about anger-inducing events, with the exception of two studies in which the similarity or witness manipulation was not effective. In addition to other problems, in one of these the similarity manipulation did not have a significant effect on perceived similarity in the no witness condition and in the other more than twice as many participants as in the other studies (20% of the sample) incorrectly answered the question about whether their ostensible partner would be reading their memory description (in the other studies the rate of incorrect responses was 10% or lower).

experiments together with any key unique elements; more minor additional details are provided in the supplemental document (SOM.1). Next we present the meta-analytic results. Experiment 5, which was methodologically more distinct, is presented separately. However, the results for the conditions and measures from Experiment 5 that were sufficiently comparable to those in Experiments 1 to 4 are included in the meta-analytic results.

Experiments 1 to 4

In Experiments 1 to 4, participants were asked to remember an experience that made them feel angry and to provide a complete and vivid description of the situation and how it made them feel. They subsequently learned whether an ostensible partner in the study would read it and whether their partner was similar or dissimilar to them. They then indicated how angry they currently felt about what happened. In Experiments 1 and 2, similarity was manipulated in terms of personality traits and values. In Experiments 3 and 4 we sought to broaden our analysis by examining the effects of psychological closeness defined in terms of demographic similarity instead of personality and values similarity.

We expected that believing that a psychologically close other was privy to the experience would enhance feelings of anger whereas believing that a psychologically distant other was privy to the experience would have the opposite effect. Notably, although we expected that we would obtain the same overall pattern of effects across these experiments, we also anticipated that a witness who was dissimilar in terms of demographic qualities and would thus constitute an outgroup member might be more potent in generating an affect attenuation effect than a witness with different personality characteristics and values.

Experiments 1 and 3 also included process measures whereby participants indicated the extent to which they believed that their ostensible partner felt sympathetic toward them

(imagined reactive empathy) and was currently feeling the same way that they were (imagined parallel empathy). According to our theorizing, individuals should imagine that psychologically close others are generally more empathic toward them, and this imagined empathy should constitute a path toward greater feelings of anger when they perceive those others as witness to the anger-inducing event.

To probe potential downstream behavioral implications, participants' endorsement of aggressive behavioral norms (Experiment 1), revenge-seeking inclinations (Experiment 3), and negative evaluations of the perpetrators (Experiment 4) were assessed. In Experiment 2 participants were asked to imagine that they had an opportunity to write a message to the person (or people, or institution, etc.) who had made them angry and the content of messages was coded for verbal aggression. Expecting that individuals' feelings of anger would be associated with their aggressive inclinations and also represent their most proximal predictor, we analyzed the effects of psychologically close and distant witnesses on these various aggression-relevant outcomes as well as the indirect effects of witnesses on these outcomes via individuals' feelings of anger about what happened.

Method

Participants

Participants in Experiments 1 and 2 were Canadian introductory psychology students whereas participants in Experiments 3 and 4 were U.S.-born individuals with a White ethnic background who were currently residing in the U.S. and who were recruited via Prolific. The detailed sample characteristics are presented in Table 1. Across Experiments 1 to 4, the final samples did not include duplicates (participants who completed portions of the study more than once), those with all data missing on key dependent measures, those who did not do the memory task or did it incorrectly (e.g., wrote nonsense or did not describe an angry memory), those who indicated suspicion about whether the ostensible other participant was real, or those who failed a manipulation check (described below) asking about whether they were told that the other participant in their session would or would not read their personal memory description. Those who took more than two standard deviations above the average time to complete the study (after extreme outliers, e.g., over eight hours, were removed) were also excluded: Because the central task in the study was essentially a mood induction, multi-tasking or taking long breaks would be problematic by virtue of disrupting the hypothesized psychological mechanisms. In Experiments 3 and 4 the same exclusion criteria were applied as in Experiments 1 and 2 except that here participants who failed the check regarding their ostensible partner's demographic characteristics (described below) or had a Prolific approval rating of 95 or lower were also excluded. We over-recruited as we estimated would be necessary to account for exclusions. Details regarding the sample size determination for each of these studies are provided in the supplemental document (SOM.2). Data collection concluded before any data analysis.

Participants were randomly assigned to one of the four cells created by the 2 (Psychologically Close vs. Distant Other) x 2 (Other as Witness: Yes vs. No) design. The [masked for anonymization] Research Ethics Board at [masked for anonymization] approved all studies reported in this paper. All exclusions are reported in the main text; each experiment included additional measures, and Experiment 2 included an additional order manipulation, all of which are described in the supplemental document (SOM.1).

Expt	Sample	Ν	Cell Ns	Exclusion Rate	Sensitivity (f)	Manipulation Check
1	Canadian introductory psychology students	292 (81 men, 211 women)	61 - 87	19.78%	.164	$\eta_p^2 = .317$ $M_{\rm diss} = 3.14 \ (1.16)$ $M_{\rm sim} = 4.80 \ (1.30)$
2	Canadian introductory psychology students	476 (191 men, 285 women)	102 - 133	15.67%	.129	$\eta_p^2 = .565$ $M_{\rm diss} = 2.46~(1.11)$ $M_{\rm sim} = 5.14~(1.23)$
3	White individuals born and residing in the United States recruited via Prolific	281 (129 men, 152 women)	62 - 76	21.94%	.168	$\eta_p^2 = .069$ $M_{\rm diss} = 3.36 (1.28)$ $M_{\rm sim} = 4.08 (1.31)$
4	White individuals born and residing in the United States recruited via Prolific	417 (199 men, 218 women)	94 - 113	22.78%	.138	$\eta_p^2 = .217$ $M_{\rm diss} = 3.15 \ (1.35)$ $M_{\rm sim} = 4.56 \ (1.33)$
5	Same-sex pairs of Canadian individuals	181 pairs (64 male, 117 female)	37 - 54	6.2%	.209	$\eta_p^2 = .379$ $M_{\rm dis} = 3.45 \ (0.11)$ $M_{\rm clo} = 5.07 \ (0.11)$

Table 1. Sample Characteristics for Experiments 1 to 5.

Notes. Introductory psychology students received partial course credit for their participation; those who participated via Prolific were paid \$2.00 USD. Exclusion rates were calculated after duplicates were removed. Sensitivity provides the results of post hoc sensitivity analyses conducted to determine the magnitude of the effect that could be detected with .80 power and $\alpha = .05$ two-tailed. Cell Ns are for the 2 x 2 design (collapsing across the order manipulation in Experiment 2). Results for the manipulation check in Experiments 1 to 4 are for perceived similarity, with standard deviations in brackets; M_{sim} = mean for similarity condition and M_{diss} = mean for dissimilarity condition. Results for the manipulation check in Experiment 5 are for feelings of closeness, with standard errors in brackets; M_{clo} = mean for close condition and M_{diss} = mean for distant condition.

Procedure

In each case the experiment was described to participants as focusing on "how experiences of computer-mediated exchanges are affected by the kinds of information that are shared" and as involving exchanging information with another participant in an online interaction. Steps were taken throughout to enhance the plausibility of the cover story that there was another participant in the session (e.g., participants were given a specific time frame for doing the study, encountered waiting periods at different points, and were told that if another participant was unavailable for any reason they would be directed to a version of the study not involving interaction).

Experiments 1 and 2 began with some initial general questions (see SOM.1 for details). In light of observing, in earlier studies, substantial variability in participants' current angry feelings about the event they described, in Experiments 3 and 4 we assessed participants' negative affect at the outset of the study and included it as a covariate in analyses so as to enhance statistical power: Participants began by completing a five-item measure of their current affective state in which they described the extent to which they currently felt *alert, angry, cheerful, guilty,* and *sad*; responses on these were combined with appropriate reverse-scoring to create an index of initial negative affect ($\alpha = .69$).

Personal Information for Exchange. Participants proceeded to a section in which they provided some personal information that ostensibly would be exchanged with their partner before their online interaction. In Experiments 1 and 2, this involved answering some questions about their traits, values, and favorite activities. Specifically, participants then answered the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003), a brief measure of the Big-Five personality dimensions that asked them to rate, on a 10-point scale (where 1 = *Strongly*)

Disagree and 10 = Strongly Agree), the extent to which they saw themselves as characterized by each of ten different trait pairs (e.g., extraverted, enthusiastic). This scale was followed by a values task that asked them to select the five values that were most important to them from a list of 15 (e.g., equality, salvation, a world at peace) drawn from Schwartz and Bilsky (1987), and a parallel hobbies and activities task that asked them to select the five hobbies and activities that they enjoyed the most from a list of 15 (e.g., reading for fun, hiking/walking/biking, cooking/baking). In Experiment 2 participants also described their political orientation (1 = very *conservative*; 10 = very*liberal*). In Experiments 3 and 4, participants only answered demographic questions about their ethnic background, country of birth, and current country of residence. At the end of these measures a message appeared thanking participants and advising them that their responses to the questions would now be provided to the other participant in the session.

Angry Memory Description. Participants were then asked to remember as vividly as they could an experience that made them feel angry. Following procedures developed by Howren and Suls (2011) and Salovey and Singer (1989), participants were instructed to draw on a real situation that actually happened to them and to imagine it as vividly as they could:

Picture the events happening to you. See all the details of the situation. Picture in your "mind's eye" the surroundings as clearly as possible. See the people or objects; hear the sounds; experience the event happening to you. Think the thoughts that you actually thought in this situation. Feel the same angry feelings that you felt then. Let yourself react as if you were actually there right now.

They were further instructed to use space that was provided to describe, as completely and vividly as possible, the situation and how it made them feel. They were asked to take

approximately eight minutes (five minutes in Experiments 3 and 4) to focus on and do the task and were advised that the advance button was temporarily disabled to facilitate this. Participants were informed that they were the only participant in their session being asked to do this task and at this point were kept blind to their witness condition: They were merely told that there was a chance their description might be shared with their partner later in the session and were advised that they could keep their description anonymous by avoiding including any personally identifying information.

The descriptions were later reviewed by independent coders blind to participants' experimental condition and were rated in terms of the seriousness of the events and the intensity of the angry feelings described. The memories were also classified in terms of whether participants were angry about an event or something that a specific person or group of people did. Across all four experiments using this paradigm participants on average reported somewhat intense angry feelings (over 5 on a 7-point scale) and events ranged considerably in seriousness (e.g., from having someone push in front of them in a lineup for coffee or cut them off in traffic to infidelity or sexual abuse). Most of the descriptions were about something that a specific individual (65.14%) or group of people (25.44%) did and centered, for example, on the behavior of family members (21.45%), friends (16.35%), strangers (13.98%), romantic partners (9.47%), and co-workers (9.39%). Further details for all experiments using this methodology are in the supplemental document (SOM.3).

Witness Manipulation. After completing the angry memory description participants were informed that they would now see their partner's answers to the personal information questions, just as their partner had seen their answers. Those in the Witness condition were further advised that their partner would be given a few minutes to read their memory description. Those in the

No Witness condition were instead advised that their partner would never see their memory description.

Psychological Closeness Manipulation. Next, participants were provided with their ostensible partner's answers to the personal information questions. In Experiments 1 and 2, in the close condition the partner's answers to the scale items (TIPI and, in Experiment 2, political orientation) varied in terms of being the same as theirs or one-scale point different and four of the five selections on both the values and hobbies and activities tasks were the same. In the distant condition the partner's answers to the scale items varied in terms of deviating from their own answers by four or five scale points and only one of the five selections on both the values and hobbies and activities tasks was the same. In Experiments 3 and 4, in the close condition the answers indicated that their partner had White ethnic background and had been born and was currently residing in the United States (matching participants' own demographic characteristics). In the distant condition the answers indicated that their partner had white ethnic background and had been born and was born and currently residing outside of the United States.

Dependent Measures

It was at this juncture that the dependent measures were administered, with the measure of current angry feelings coming before the process and behavioral measures.

Current Angry Feelings. Participants indicated their current feelings about the experience that they described in their memory description, with instructions to answer according to how they felt "right now" about the experience. Three items assessed anger (*angry, irritated* and *annoyed*, α s = . 89 to .92 across experiments). Unless otherwise indicated, for these and all other

scale ratings participants answered on a 7-point scale on which higher numbers represented greater endorsement.²

Process Measures. In Experiments 1 and 3, participants completed two imagined reactive empathy items assessing the extent to which they perceived that the other participant sympathized with them and felt compassionate toward them (e.g., "To what extent do you think that the other participant sympathizes with you?"; $\alpha s = .82$ and .89 across studies), and two imagined parallel empathy items (three items in Experiment 3) assessing the extent to which they perceived that the other participant felt the same way that they did and identified with how they were feeling right now (e.g., "To what extent do you think the other participant feels the same way that you do right now?"; $\alpha s = .78$ and .84 across studies); rs = .50 and .79 in Experiments 1 and 3 respectively. Note that to be sensible even in the no witness condition these were necessarily broad measures about empathy in general rather than about empathy in connection with the anger-inducing event. Thus, akin to the predicted pattern for perceived similarity, the expectation would be for main effects of the similarity manipulation on these perceptions. It is the connection to feelings of anger that should be specific to the case where the other participant is perceived as witness to the event.

Behavioral Outcomes. In Experiment 1, participants completed the Endorsement of Aggressive Norms scale (EAN; Krahé & Möller, 2004). This scale contains 15 items, eight of

² Each of the studies included measures of additional affective states beyond anger. Sadness, guilt, and forgiveness were assessed in all studies and in Experiment 5 nervousness, confidence, and happiness were also assessed. There were some effects of the manipulations on these outcomes in Experiments 1 and 2. For example, in Experiment 1, participants who perceived their partner as similar to them felt less forgiving if they thought their partner had read their memory than if they did not. However, there were no effects on any of these measures in Experiments 3 to 5. The details are provided in the supplemental document (SOM.4). On the basis of the fact that it was only Experiment 1 that yielded results for other affective states (namely, sadness and forgiveness) that clearly followed the same pattern as anger, we tentatively conclude that the dynamics uncovered by the present experiments do not reliably extend to affective states other than anger. At the same time we acknowledge that there may be circumstances (yet to be identified) in which psychologically close and distant witnesses to potentially anger-inducing events also affect other kinds of emotional reactions that individuals may have to what happened.

which assess relational aggression (e.g., treating someone else like they don't exist; $\alpha = .69$) and seven of which assess physical aggression (e.g., destroy another's possessions; $\alpha = .70$). Ratings were made on a 4-point scale, (1 = not at all ok, 4 = totally ok); scores were square-root transformed to reduce positive skew.

In Experiment 2, participants were asked to imagine that they had an opportunity to write a message to the person (or people, or institution, etc.) who had made them angry and to describe, in an open-ended format, what they would say. We had two coders blind to the hypotheses and experimental conditions review the messages and code the number of insults directed at the target (e.g., "Your life sounds really pathetic and I know you won't be successful at all"; "I think you are a terrible teacher and should never teach again") and standardized and averaged their counts together ($\alpha = .76$); scores were square-root transformed to reduce positive skew.³

In Experiment 3, participants completed four items (α = .94) assessing their inclinations toward seeking revenge against the person or people who made them angry in the experience that they described (e.g., "I would like to get back at them in some way if I could"); these items were based on McCullough et al. (1998; see also Struthers et al., 2019).

In Experiment 4, participants completed eight items ($\alpha = .97$) based on the Negative Evaluation Task (NET) that asked them about their perceptions of the person or people who made them angry in the experience that they described. The NET is a widely used measure of aggression that has been employed in both laboratory (e.g., Twenge, Baumeister, Tice, & Stucke, 2001) and online studies (e.g., Greitemeyer & Sagioglou, 2018). The specific evaluative

³ We originally combined these insult scores with the number of anger words (e.g., hate, kill), 2nd person pronouns (e.g., you, your), and swear words in the messages that participants wrote (see, e.g., Al-garadi, Varathan, & Ravana, 2016; Kim, Clark, Donnellan, & Burt, 2020). In response to comments received during the review process and the potential for redundancy across these words and insults, we no longer do so.

dimensions used here (*warm, competent, friendly, capable, conscientious, likable, kind, intelligent*) were drawn from Carrier, Dompnier, and Yzerbyt (2019). The items were scored in a negative direction such that higher scores reflected more negative evaluation of the perpetrators.

Manipulation Checks. Finally, across Experiments 1 to 4 one item assessed how similar participants felt to the other participant and the last question was a check on the witness manipulation whereby participants were asked to recall whether they were told that the other participant would or would not read their personal memory description; there was also a third "I don't remember" response option. Those who actively selected the inaccurate response for their experimental condition were considered to have failed the manipulation check. In this and all studies reported in this paper participants were fully debriefed immediately at the end of the study. The key methodological details for Experiments 1 to 5 are summarized in Table 2.

	Psychological Closeness Manipulation	Process Measure(s)	Behavior Measure(s)
Expt 1	Personality and Values Similarity	Imagined Reactive and Parallel Empathy	Endorsement of Aggressive Norms (Relational & Physical)
Expt 2	Personality and Values Similarity		Verbal Aggression in Message to Perpetrator(s)
Expt 3	Demographic Similarity	Imagined Reactive and Parallel Empathy	Revenge-Seeking Inclinations
Expt 4	Demographic Similarity		Negative Evaluation of Perpetrator(s)
Expt 5	Relationship (Close Other vs. Stranger)	Imagined Parallel Empathy	

Table 2. Methodological Details for Experiments 1 to 5.

Results

All measures were analyzed in 2 (Psychologically Close vs. Distant Other) x 2 (Other as Witness: Yes vs. No) Analyses of Variance (ANOVAs). These ANOVAs generated the *p*-values and effect sizes used in the mini meta-analyses, which were conducted in accordance with the procedures specified by Goh, Hall, & Rosenthal (2016) and Rosenthal (1991).⁴

Manipulation Check. Across Experiments 1 to 4, the analysis of participants' perceived similarity to their ostensible partner yielded a main effect for partner similarity confirming that the manipulation of psychological closeness was effective, all ps < .001, and no other effects. Details are presented in Table 1.

Current Angry Feelings. The results of the mini meta-analysis of how angry participants currently felt about the anger-inducing event are presented in Tables 3 and 4, with the means and confidence intervals in Table 3 and the statistical details for the Psychological Closeness x Witness interaction and associated simple effects in Table 4. These results reveal, as predicted, that participants felt angrier about what happened when they perceived that a psychologically close other was witness to the anger-inducing event than when they perceived that the close other was unaware of it. This result is indicated by the significant overall positive effect of witnessing within the close other condition. In contrast, participants felt *less* angry about what happened when they perceived that a psychologically distant other was witness to the anger-inducing event than when they perceived that a psychologically distant other was witness to the anger-inducing event than when they perceived that the distant other was unaware of it. This result is indicated by the significant overall positive is indicated by the significant other was witness to the anger-inducing event than when they perceived that the distant other was unaware of it. This result is indicated by the

⁴ As previously noted, in Experiments 3 and 4 the analyses also included participants' negative affect at the outset of the study as a covariate. In Experiment 2 the analyses also included the order manipulation described in the supplemental document (SOM.1), which did not qualify the Psychological Closeness x Witness interaction, F(1, 468) = 0.001, p = .977, $\eta_p^2 = .000$, for the 3-way interaction.

The significant overall positive effect of closeness within the witness condition further revealed that participants were angrier about what happened when the event was witnessed by someone who was psychologically close rather than distant. The data from Experiment 5 were clearly important to this simple effect, an issue to which we return in the Discussion section. In contrast, when the other was not aware of the event participants were less angry when the other was psychologically close rather than distant, perhaps because of the self-affirming effect of being exposed to a similar other (see, e.g., Singh et al., 2017; Sprecher et al., 2013). As would be expected from this pattern of contrasting simple effects the overall Psychological Closeness X Witness interaction was statistically significant.

	Psychological Closeness Manipulation	Distant Other/ Not Witness	Distant Other/ Witness	Close Other/ Not Witness	Close Other/ Witness
Expt 1	Personality and Values Similarity	4.836 [4.351; 5.321]	4.282 [3.853; 4.711]	3.465 [2.998; 3.931]	4.341 [3.935; 4.747]
Expt 2	Personality and Values Similarity	4.233 [3.903; 4.563]	4.105 [3.778; 4.432]	3.674 [3.317; 4.030]	4.234 [3.922; 4.546]
Expt 3	Demographic Similarity	5.009 [4.580; 5.438]	4.419 [4.029; 4.809]	4.538 [4.129; 4.946]	4.691 [4.304; 5.077]
Expt 4	Demographic Similarity	4.720 [4.366; 5.074]	4.193 [3.870; 4.516]	4.380 [4.047; 4.714]	4.605 [4.268; 4.941]
Expt 5	Relationship (Close Other vs. Stranger)	(Win) 0.475 [0.320; 0.630]	(Loss) 0.370 [0.237; 0.503]	(Win) 0.405 [0.245; 0.566]	(Loss) 0.600 [0.462; 0.738]

Table 3. Means and 95% Confidence Intervals for Current Angry Feelings about the Event as aFunction of Other Person's Psychological Closeness and Status as Witness to Angering Event

Note. In all studies participants indicated their angry affect on a 7-point response scale. To minimize positive skew in Experiment 5 we dichotomized responses according to whether participants selected the lowest possible number on the scale (reflecting no anger at all) versus reported some level of anger (coded 0 and 1 respectively). All meta-analyses only included the loss condition from Experiment 5.

	Witness Effect for Distant Other	Witness Effect for Close Other	Closeness Effect for No Witness	Closeness Effect for Witness	Witness x Closeness Interaction
Expt 1 Personality and Values Similarity	.010 p = .093	.026 <i>p</i> = .006	.053 p < .001	.000 <i>p</i> = .844	.033 $p = .002$
Expt 2 Personality and Values Similarity	.001 p = .588	.011 <i>p</i> = .021	.011 p = .024	.001 <i>p</i> = .575	.009 p = .042
Expt 3 Demographic Similarity	.014 p = .047	.001 <i>p</i> = .593	.009 p = .119	.003 <i>p</i> = .331	.012 $p = .072$
Expt 4 Demographic Similarity	.011 p = .031	.002 <i>p</i> = .353	.005 p = .171	.007 <i>p</i> = .084	.012 p = .029
Expt 5 Relationship (Close Other vs. Stranger)	n/a	n/a	n/a	(Loss Condition) .031 p = .019	n/a
Meta-Analysis	.007 Z = 2.930 p = .003	.007 Z = 3.246 p = .001	.014 Z = 4.307 p < .001	.003 Z = 2.251 p = .024	.014 Z = 4.382 p < .001

Table 4. Effect Sizes (η_p^2) for Witness X Psychological Closeness Interaction and Simple Effects on Feelings of Anger.

Note. Significance values are two-tailed. Simple effects involving greater anger in the witness as compared to no witness condition or in the close as compared to distant condition (i.e., positive effects) are bolded; those involving effects in the opposite direction (i.e., negative effects) are italicized. Only the results from the loss (and not the win) condition of Experiment 5 are included in the mini meta-analysis, which was conducted in accordance with the procedures specified by Goh et al. (2016) and Rosenthal (1991), weighting results by the sample size of each study.

Process Measures. The meta-analytic results for imagined reactive and parallel empathy

are presented in Table 5. In each case there is a clear overall meta-analytic effect of the

psychological closeness manipulation.

Imagined Reactive Empathy							
Experiment	Psychological Closeness Manipulation	η_p^2	Ζ	р			
1	Personality and Values Similarity	.061	4.267	<.001			
3	Demographic Similarity	.010	1.654	.098			
	Meta-Analysis (1 and 3)	.031	4.221	<.001			
Imagined Parallel Empathy							
1	Personality and Values Similarity	.042	3.520	< .001			
3	Demographic Similarity	.010	2.614	.107			
5 Relationship (Close Other vs. Stranger)		.031	2.339	.019			
	Meta-Analysis (1, 3, 5)	.025	4.290	< .001			

Table 5. *Effect Sizes* (η_p^2) For Psychological Closeness Main Effect for Imagined Reactive and Parallel Empathy.

Note. Significance values are two-tailed. Effect sizes from Experiments 1 and 3 are from the main effect of psychological closeness, whereas effect sizes from Experiment 5 are from the simple effect of closeness (i.e., close other vs. stranger) in the loss condition. The mini meta-analysis was conducted in accordance with the procedures specified by Goh et al. (2016) and Rosenthal (1991), weighting results by the sample size of each study. There were no other significant or marginal effects.

To meta-analyze the indirect effects on participants' feelings of anger via imagined reactive and parallel empathy across experiments we conducted multigroup meta-analytic structural equation modeling (MASEM; for an introduction see Cheung, 2021) using the R package metaSEM (Cheung, 2015). The pooled correlation matrix was computed by averaging the correlations among psychological closeness, type of empathy, and anger across experiments separately in the no witness and witness conditions. Note that we treated the loss condition from Experiment 5 as an instance of witnessing an angering event, but did not include correlations from the win condition. The mediation SEM was then fitted to these pooled correlation matrices using weighted least square estimation (WLS). This analysis allowed us to examine the strength and significance of the individual pathways in the combined mediation models. The analyses were conducted separately for imagined reactive and parallel empathy.

In line with predictions, a significant overall indirect effect of psychological closeness on participants' feelings of anger via imagined parallel empathy emerged in the witness condition, but not in the no witness condition; the same was true for imagined reactive empathy. The results are presented in Figure 1. However, when we conducted these analyses with an alternative approach that also tests the contrast between the indirect effects in the witness and no witness conditions, results suggested that the overall indirect effect was not reliably different according to witness status for either imagined reactive or parallel empathy and yielded somewhat weaker results for imagined reactive empathy (see SOM.5 for details).



Imagined Reactive Empathy

Figure 1. Path coefficients in a meta-analytic mediation model predicting participants' feelings of anger from the other person's psychological closeness via imagined parallel empathy in the (A) no witness and (B) witness conditions in Experiments 1, 3, and 5. Effect size estimates do not include correlations from the win condition in Experiment 5. *p < .05 ***p < .001.

Downstream Behavioral Implications. In view of the relationship between gender and aggressive behavior (Archer, 2009), to increase the sensitivity of our analysis (see Wang, Sparks, Gonzales, Hess, & Ledgerwood, 2017) we included gender as a covariate in all of our analyses of outcomes relevant to aggressive behavior.⁵

The meta-analytic results for behavioral outcomes are presented in Table 6. In line with the expected pattern, participants tended to exhibit more aggressive behavioral responses when a psychologically close rather than distant other witnessed the anger-inducing event. However, this effect was only marginal, as was participants' tendency to exhibit more aggressive inclinations when they perceived that a psychologically close other was witness to the anger-inducing event than when they perceived that the close other was unaware of it. The Psychological Closeness x Witness interaction implied by these patterns was marginal as well. Perusal of the effects across the different experiments reveals that significant effects were evident in Experiment 2, in which participants composed messages to the perpetrator(s), but not in the other experiments, in which they rated their aggression-relevant feelings on a scale. We consider this issue further in the Discussion sections.

⁵ We present the results without the covariate in SOM.6. Results with and without the covariate were very similar.

Behavioral Outcome	Witness Effect for Distant Other	Witness Effect for Close Other	Closeness Effect for No Witness	Closeness Effect for Witness	Witness x Closeness Interaction
Expt 1 ^a Endorsement of Aggressive Norms (Relational and Physical)	.000 p = .891	.000 <i>p</i> = .816	.000 p = .946	.000 <i>p</i> = .863	.000 <i>p</i> = .950
Expt 2	.005	.012 <i>p</i> = .016	.008	.009	.016
Verbal Aggression	p = .130		p = .054	<i>p</i> = .044	<i>p</i> = .005
Expt 3	.001	.002 <i>p</i> = .463	.002	.001	.000
Revenge-Seeking	<i>p</i> = .581		p = .469	p = .539	<i>p</i> = .909
Expt 4 Negative Evaluation of Perpetrator(s)	.000 p = .726	.000 p = .862	.002 <i>p</i> = .354	.003 <i>p</i> = .251	.000 <i>p</i> = .899
Meta-Analysis	.000	.002	.001	.002	.002
	Z = 0.895	Z = 1.796	Z = 0.950	Z = 1.751	Z = 1.897
	p = .371	<i>p</i> = .073	p = .342	p = .080	<i>p</i> = .058

Table 6. Effect Sizes (η_p^2) for Witness X Psychological Closeness Interaction and Simple Effects for all Behavioral Outcomes.

Note. Significance values are two-tailed. The mini meta-analysis was conducted in accordance with the procedures specified by Goh et al. (2016) and Rosenthal (1991), weighting results by the sample size of each study. Simple effects involving more aggressive behavior in the witness as compared to no witness condition or in the close as compared to distant condition (i.e., positive effects) are bolded; those involving effects in the opposite direction (i.e., negative effects) are italicized. ^aIn Experiment 1 effect sizes were averaged across outcomes to avoid violation of statistical independence in the computation of the combined meta-analytic effect by including multiple outcomes obtained from the same set of participants (see e.g., Borenstein, Hedges, Higgins, & Rothstein, 2009). Experiment 5 did not include a behavioral outcome.

We proceeded to test the indirect effects on behavioral outcomes via participants'

feelings of anger across experiments using similar meta-analytic procedures as for the process

measures. Specifically, we first computed a pooled correlation matrix by averaging the

correlations among witness status, feelings of anger, and behavioral outcome across experiments

separately in the distant and close other conditions.⁶ Next, we fitted a simple mediation SEM on these pooled correlation matrices using WLS.

The results, presented in Figure 2, reveal that when the other person was psychologically close, having them witness the anger-inducing event (versus not) led to increased aggressive inclinations via increased feelings of anger. In contrast, when the other person was psychologically distant, having them witness the anger-inducing event (versus not) led to reduced aggressive inclinations via reduced feelings of anger. When we conducted these analyses with the alternative approach that also tests the contrast between the indirect effects in the psychologically distant versus close conditions, results suggested that the overall indirect effect was reliably different according to the status of the other person as psychologically close versus distant (see SOM.7 for details).

⁶ Whereas our choice as to how to parse the Psychological Closeness X Witness interaction for the test of indirect effects on anger via imagined empathy was theoretically driven, for behavioral outcomes (including the additional analyses in SOM.9) this decision was made in a bottom-up, data-driven fashion so as to yield the most readily interpretable pattern of results.



Indirect effect: -0.024 [-0.0442; -0.0087]



Indirect effect: 0.034 [0.0135; 0.0570]

Figure 2. Path coefficients in a meta-analytic mediation model predicting all behavioral outcomes from other person's status as witness via participants' feelings of anger in the (A) psychologically distant and (B) close other conditions. ***p < .001.

Discussion

The results of the meta-analysis of the data from Experiments 1 to 4 were consistent with our hypothesis that perceiving a psychologically close other as witness to an anger-inducing event would intensify individuals' feelings of anger about what happened, whereas perceiving a psychologically distant other as witness would instead have an anger-attenuating effect. Specifically, individuals who were paired with a psychologically close other felt angrier about the event they had recalled when they believed that the other was privy to the experience than when they believed that the other was not aware of what happened. Those paired with a psychologically distant other showed the opposite pattern, feeling *less* angry about the event when they believed that the other was privy to, rather than unaware of, the experience. In line with these contrasting patterns, the interaction between the other's status as close versus distant and witness versus not was significant.

Notably, although overall participants were angrier about what happened when the event was witnessed by someone who was psychologically close rather than distant, this significant meta-analytic simple effect of closeness within the witness condition was dependent on the inclusion of Experiment 5: Across Experiments 1 to 4 only, $\eta_p^2 = .001$, Z = 1.752, p = .080 (two-tailed). Relatedly, we believe, in the no witness condition there was an unexpected effect whereby participants were less angry when the other was psychologically close rather than distant. As noted previously, we suspect (in hindsight) that the closeness effect that was evident in the no witness condition was likely a function of the self-affirming consequences of being exposed to similar others, especially others with similar values. A substantial main effect of mere exposure to a similar other (illustrated most clearly in the no witness condition) makes the reversal in the witness condition harder to see even though the cross-over interaction pattern is

very consistent. The procedures followed in the present research, particularly for Experiments 1 and 2 in which concrete, detailed information about a stranger's personality characteristics and values was provided, may have made the self-affirming consequences of similarity more potent than would typically be the case in everyday life. In many real world contexts in which anger-inducing events are witnessed by a similar audience, information about the audience's similarity is apt to be less salient than the event, such that self-affirmation effects are weaker and the event itself – to which imaginings of empathy that fan the flames of anger are attached – is more squarely the focus of attention.

Another notable aspect of the pattern of results is that in Experiments 1 and 2, in which psychological closeness was manipulated in terms of personality and values similarity, the strongest effect on anger that was evident was for the close witness. In contrast, in Experiments 3 and 4, in which psychological closeness was manipulated in terms of demographic similarity, the strongest effect on anger that was evident was for the distant witness: The clearest finding was for individuals to feel less angry about the event they described when they perceived that someone with different demographic characteristics was aware rather than unaware of the experience, suggesting the potency of outgroup witnesses to attenuate angry affect. Unlike in Experiments 1 and 2, in these experiments there was no impact of a close witness, possibly reflecting that for individuals belonging to majority or dominant groups little sense of bond or connection is fostered by encountering someone who shares demographic characteristics, at least when there is nothing in the context to make shared group membership salient.

The findings from the process measures suggested that individuals generally perceived a psychologically close as compared to distant other to be more sympathetic toward them and to be more apt to be feeling the same things they were. These imaginings of reactive and parallel

empathy fueled individuals' feelings of anger when they perceived the person as aware of their anger-inducing experience, that is, in the circumstance in which individuals would expect the sympathy to center on the experience and the other's feelings to involve anger. However, the evidence for distinct patterns across the witness and no witness conditions was somewhat limited.

We believe that the overall pattern for mediation by imagined empathy was weakened by the nonsignificant effects for imagined empathy in Experiment 3, in which psychological closeness was manipulated in terms of demographic similarity and it was dissimilar witnesses that affected anger. Corollary analyses revealed that in this experiment, unlike in Experiments 1 and 5, no significant relation between imagined reactive or parallel empathy and feelings of anger in either the witness or no witness condition was evident (see SOM.8 for the analysis of the indirect effects in Experiment 1 only; the results for Experiment 5 are subsequently reported in the main text). Thus there was no indication that conscious imaginings of empathy (or, more specifically, the lack thereof) contributed to the effects of demographically dissimilar witnesses on participants' feelings of anger. The absence of evidence here suggests that other mechanisms – perhaps involving imaginings of the witness's perceptions and cognitions – are important to the anger-attenuating effect of psychologically distant witnesses.

In terms of downstream behavioral outcomes, which included endorsement of aggressive norms, a desire for revenge against the perpetrator(s), negative evaluations of the perpetrator(s), and insults contained in messages composed to the perpetrator(s), the meta-analytic effects were only marginal. However, in line with predictions the overall pattern echoed the results for feelings of anger, with psychologically close witnesses tending to enhance aggressive behavioral inclinations. Interestingly, Experiment 2, in which the behavior measure involved leading participants to construe the perpetrator(s) as the target of their responses, was the only one that yielded significant effects: Psychologically close witnesses stimulated enhanced verbal aggression in the form of insults. From these results it is tempting to conclude that the behavioral effects of psychologically close versus distant witnesses are clearest for behaviors directed toward the perpetrators, an issue to which we return in the General Discussion.

The results of the meta-analysis of indirect effects on behavior were stronger: When the other person was close there was a path from witnessing to enhanced aggressive inclinations via increased angry feelings, and when the other person was distant there was a path from witnessing to reduced aggressive inclinations via decreased angry feelings. There was also some tentative evidence from Experiment 2 (described in detail in SOM.9) that whereas close witnesses can strengthen the connection between inner feelings of anger and outward behavior towards perpetrators and thus have an emboldening or galvanizing effect, distant witnesses can instead inhibit individuals from acting on their feelings and weaken this connection.

Experiment 5

Whereas Experiments 1 to 4 all shared a common procedure involving having participants reflect on a significant personal memory involving feeling angry, in Experiment 5 participants were randomly assigned to have an experience in the lab that was potentially angerinducing or to have a more positive experience. Further, whereas Experiments 1 to 4 all operationalized psychological closeness versus distance in terms of similarity, Experiment 5 probed the effects of witnesses who were friends or strangers: Participants experienced a gambling loss or gain in the laboratory in front of a friend or stranger and then reported how angry they were. Even though the gambling outcome was randomly determined and the monetary implications were minor (\$10.00 CAD), we anticipated that participants would nonetheless feel some level of control and investment in the outcome (Langer, 1975), such that a loss would be frustrating and have the potential to provoke at least low levels of anger (Berkowitz, 1989; see also e.g., Jones & Sheffield, 2007).

Thus, this experiment tested our hypothesis about the effects of psychologically close versus distant witnesses in terms of the relationship that individuals have with the witness, in the context of controlled experiences that were experimentally manipulated, and in reference to a triggering incident that was much more minor in nature than considered in the previous experiments. Further, in having the control condition in which an angering event was not witnessed involve the witnessing of a positive experience by the other person, this experiment also enabled us to confirm the specificity of the effects obtained thus far to the witnessing of potentially anger-inducing experiences.

With respect to underlying process, the current experiment included a more direct measure of imagined parallel empathy that asked participants about how angry they thought that the witness was currently feeling. Our main prediction was that participants would feel angrier about a gambling loss in front of a friend than a stranger and that this effect would be mediated by their imaginings of the other person's current feelings of anger; no such effects were anticipated in the case of a win.

Finally, we also probed, on a corollary basis, whether the initial impact of a close versus distant witness would quickly evaporate once constraints were lifted or instead would be sustained over time and free interaction: Following the first stage of the study in which the witness had to sit quietly and observe, after which the key dependent measures were collected,

participants had a face-to-face discussion with their friend or stranger partner in the study and then reported on their feelings again.⁷

Method

Participants

Participants were 181 same-sex pairs (64 male pairs, 117 female pairs). Ninety-four pairs were previously unacquainted Canadian introductory psychology students (stranger pairs). The remaining eighty-seven pairs were comprised of one introductory psychology student and a close other that they brought to the study with them (close pairs). The vast majority of these were friends but the sample included a few siblings and cousins. This number does not include four pairs whose self-reports of their relationship did not match their relationship condition and who were difficult to re-classify, two pairs in which there were procedural problems surrounding the gambling task, or six pairs in which the target or judge met the clinical criteria for problem gambling (obtaining a score over eight on Problem Gambling Severity Index [PGSI; Ferris & Wynne, 2001, administered at the end of the study]). Pairs were distributed across one of the four cells created by the 2 (Friend vs. Stranger) x 2 (Loss vs. Win) design (see Table 1 for additional details). As described below, whether the target participant won or lost was randomly determined by the spin of a wheel. Our recruitment efforts were guided by considerations not relevant to the present analysis (i.e., to recruit as many participants as possible with non-zero PGSI scores; in connection with this the study was run across two academic years, with a different experimenter in each year). Data collection concluded before any of the analyses reported in the present paper

⁷ Results from other measures collected in this study (described in the supplemental document (SOM.1)) are reported in another paper focusing on the accuracy with which individuals can identify problem gambling tendencies in others. The other paper addresses completely different questions than are of interest here, centering on the accurate detection of problem gambling tendencies in others, and accordingly reports the results on different measures (all different versions of the PGSI scale) than those analyzed in the current paper.

were conducted. All introductory psychology students received partial course credit for their participation whereas others participated on a purely volunteer basis.

Procedure

Participants in stranger pairs arrived individually for the study, which was described as focusing on "social perception and decision-making in first meeting situations." Upon their arrival these pair members went to separate waiting rooms and they were brought to the study room one at a time and then introduced to ensure they did not meet before the session. Members of close pairs instead arrived together. After the experimenter explained the study procedures participants provided informed consent.

The gambling task then took place. Participants were told that through random assignment one pair member was selected to complete the gambling task and the other was selected to watch (referred to here as the target and judge respectively, although these terms were not used in front of participants). The experimenter handed \$5.00 to the target and directed both participants' attention to a spinning wheel on the table on which each of four colors appeared twice. The experimenter then outlined two same-odds options as to how to spin the wheel with the chance to win \$10.00. Specifically, the target could choose one color and spin the wheel twice or choose two colors and spin the wheel once, a choice we gave participants so as to enhance their feelings of control over and investment in the outcome. If the wheel landed on the selected color the target received another \$5.00 (the \$5.00 bill was replaced with a \$10.00 bill); if it did not, targets returned the \$5.00 they had been given to the experimenter. The experimenter explained that either way they had a 50/50 chance of winning and framed it as a "double or nothing" situation. After this was all explained, the judge was told: "You can just

watch." The target then chose an option and either won or lost, after which the key dependent measures (described below) were administered.

Participants then had a 10-minute discussion. The experimenter provided them with a list of discussion topics (e.g., favorite pastimes and hobbies, positive and negative academic and social experiences). After instructing them to "please begin with some initial introductions and exchange of information (e.g., what's on your mind right now, your day so far...)" and then turn to the topics provided, the experimenter turned on a video camera (if both pair members consented to this) and left the pair alone for the duration of the discussion.

Dependent Measures. Immediately after the gambling task targets completed a set of items assessing their current affective state. They were instructed to answer according to how they felt "right now, in the current moment." Most relevant to the present analysis, three items assessed anger (*angry at others, hostile, irritated*; $\alpha = .71$). They then completed the same affect items according to the extent they thought that the other participant felt that way right now, at the current moment ($\alpha = .79$).

After the discussion targets completed the same items assessing their current affective state as they had completed beforehand. As well, both targets and judges rated their closeness to the other person and completed Aron, Aron, and Smollan's (1992) Inclusion of Other in the Self Scale (IOS). This scale contains seven Venn diagrams representing varying degrees of self–other overlap, scored so that 1 = no overlap and 7 = greatest overlap. These measures were combined to create a closeness index (α s = .85 and .90 for targets and judges respectively). Toward the end of their respective questionnaires both targets and judges were asked whether they had met the other participant before the session, and if so, to explain how they knew each other.

Results

Closeness Manipulation Check. Targets' and judges' feelings of closeness were analyzed in a repeated-measures ANOVA, with pairs as the unit of analysis and Relationship (Friend vs. Stranger) and Outcome (Loss vs. Win) as between-pairs factors and Role (Target vs. Judge) a within-pairs factor. Confirming that friend pairs felt closer than stranger pairs, there was a substantial main effect of relationship (see Table 1 for details). The only other significant effect was a three-way Relationship x Role x Outcome interaction, F(1, 177) = 4.51, p = .035, $\eta_p^2 =$.025, whereby judges tended to feel closer to friend targets who lost as compared to won (p =.052, $\eta_p^2 = .021$) and no significant effect of outcome anywhere else.

Affective Reactions. Preliminary inspection of the distribution of targets' reports of angry affect immediately following the betting task revealed substantial positive skew (2.25), with roughly half the sample (54%) obtaining a mean score of 1 (the lowest possible) and the remainder indicating low to moderate levels of angry affect (maximum score = 5.00). Dichotomizing these scores into two groups (no angry affect vs. some level of anger reported) proved the most effective means of minimizing skew (resultant skew = 0.15); we followed this same procedure for all of the other anger measures, which were similarly skewed. When these data were analyzed in a 2 (Relationship: Friend vs. Stranger) x 2 (Outcome: Loss vs. Win) ANOVA, results indicated a significant Relationship x Outcome interaction, F(1, 177) = 4.03, p = .046, $\eta_p^2 = .022$ (see Tables 1 and 2 for means and simple effects details). Targets were more likely to report feeling angry when they lost in front of a friend than a stranger, whereas there was no effect of relationship in the win condition. The effect of outcome was marginal in the friend condition; there was no outcome effect in the stranger condition. The absence of an attenuating effect here may have been due to the fact that although dyad members were

strangers, they had a shared identity as introductory psychology students at the same university who were experiencing the rather novel and unusual procedures of the study together, which could have limited how distant they felt from one another. There were no other effects.⁸

To probe whether the anger-enhancing effect of having a friend present for a loss experience was still evident ten minutes later after a face-to-face discussion, we analyzed targets' feelings of anger before versus after the discussion in a repeated-measures ANOVA with Relationship (Friend vs. Stranger) and Outcome (Loss vs. Win) as between-subjects factors and Time (Before vs. After Discussion) a within-subjects factor. The Relationship x Outcome interaction was again evident, F(1, 177) = 4.73, p = .031, $\eta_p^2 = .026$, but was not moderated by time, three-way interaction F(1, 177) = 0.094, p = .759, $\eta_p^2 = .001$. Indeed, even after the discussion targets were more likely to report feeling angry when they had lost in front of a friend (M = 0.46, SE = 0.06) than a stranger (M = 0.20, SE = 0.06), F(1, 177) = 8.28, p = .004, $\eta_p^2 =$.045. Further simple effects analyses revealed that here the effect of outcome was significant in the friend, F(1, 177) = 4.29, p = .040, $\eta_p^2 = .024$, but not the stranger condition, F(1, 177) =0.971, p = .326, $\eta_p^2 = .005$. The only other effect was a main effect for time whereby anger was lower after (M = 0.30, SE = 0.03) than before the discussion (M = 0.46, SE = 0.04), F(1, 177) =26.62, p < .001, $\eta_p^2 = .131$ (Fs < 1 for all other effects involving time).⁹

Process Measures. Targets' perceptions of judges' current feelings of anger immediately following the betting task were of critical interest. When these data were analyzed in a 2 (Relationship: Friend vs. Stranger) x 2 (Outcome: Loss vs. Win) ANOVA, results indicated a significant Relationship x Outcome interaction, F(1, 177) = 4.82, p = .029, $\eta_p^2 = .027$, whereby

⁸ Logistic regression yields virtually identical results, B = -1.219 (SE = 0.61), Wald = 3.961, p = .047 for the Relationship x Outcome interaction.

⁹ Repeated-measures logistic regression yields virtually identical results, Wald = 4.400, p = .036 for the Relationship x Outcome interaction; Wald = 0.0002, p = .989 for the three-way interaction.

targets were more likely to report that a friend (M = 0.58, SD = 0.50) than a stranger (M = 0.30, SD = 0.46) felt angry after they had lost, F(1, 177) = 8.88, p = .004, $\eta_p^2 = .047$; there was no effect of relationship in the win condition, Ms = 0.46 (SD = 0.51) and 0.50 (SD = 0.51) for friends and strangers respectively, F(1, 177) = 0.131, p = .718, $\eta_p^2 = .001$.¹⁰

In view of the substantial correlation between targets' feelings of anger and their perceptions of judges' feelings of anger after the betting task, r(179) = 0.51, p < .001, we proceeded to test mediation. These analyses were conducted using the mediation R package (Tingley, Yamamoto, Hirose, Keele, & Imai, 2014) with CIs computed using 10,000 bootstrap samples. Results indicated that in the loss condition the path from relationship to targets' perceptions of the judge's anger to targets' own feelings of anger was significant, whereas no such indirect effect was evident in the win condition. These results are depicted in Table 7. A similar pattern was evident for targets' post-discussion feelings of anger, 95% CI [0.0365, 0.2675] in the loss condition and 95% CI [-0.1284, 0.0898] in the win condition.

	Loss condition				Win condition			
	Estimate	LCI	UCI	Estima	te LCI	UCI		
Indirect effect	0.15	0.0351	0.2639	0.02	-0.1427	0.1012		
Direct effect	0.09	-0.0959	0.2792	-0.05	-0.2270	0.1252		
Total effect	0.24	0.0349	0.4243	-0.03	-0.2961	0.1595		

Table 7. Estimates from a moderated mediation model predicting participants' own feelings of anger from relationship of partner (stranger vs. friend) and gambling task outcome (loss vs. win) via their perceptions of their partners' anger.

Note. N = 181. LCI and UCI = lower and upper 95% bootstrap confidence intervals. The model for both the mediator and outcome is a logistic regression.

¹⁰ Logistic regression yields virtually identical results, B = -1.350 (SE = 0.62), Wald = 4.801, p = .028 for the Relationship x Outcome interaction.

Discussion

In line with hypotheses, the results of Experiment 5 revealed that participants felt angrier about a gambling loss when it occurred in front of a friend rather than a stranger and suggested that this effect may have arisen as a function of participants' imagining that their friend would feel angrier than a stranger in the wake of their loss. Participants experiencing a loss perceived that friends were roughly twice as likely as strangers to feel at least a hint of anger (58% vs. 30%), and participants' own feelings of anger followed suit, with 60% paired with a friend and 37% paired with a stranger reporting feeling at least a little angry. Along these lines, analyses revealed a significant indirect path from individuals' relationship with the witness (friend vs. stranger) to their estimates of the witness's level of anger (i.e., imagined parallel empathy) to their own feelings of anger in the wake of a potentially anger-inducing experience: They perceived a friend (versus stranger) to be angrier, which was associated with feeling angrier themselves. We acknowledge here, however, that we cannot rule out the possibility that the closeness of the relationship affected the extent to which individuals projected their own feelings onto the witness. In line with hypotheses, all of these effects were specific to the negative event of a loss experience and were not evident when participants had the positive experience of winning the bet. However, it should be noted that the critical interaction on participants' own feelings of anger just barely passed the threshold for statistical significance.

Obtaining a pattern of results conceptually parallel to the pattern across Experiments 1 to 4 with a different paradigm strengthens the support for our hypotheses. Specifically, the results of Experiment 5 build on and extend those from the first four experiments by operationalizing psychological closeness in terms of relationship rather than similarity, examining angry feelings in response to a controlled event that was experimentally manipulated, probing reactions in the context of a real in-person experience rather than a recalled event in an ostensible online exchange, and examining feelings of anger in response to a triggering incident that was much more minor in nature than those considered in the previous experiments. In connection with this last point, overall levels of anger experienced in the wake of the loss were quite low, such that our analyses necessarily focused on whether participants reported feeling any anger at all.

Intriguingly, our corollary analysis of how angry participants felt more than ten minutes after the gambling task, following a face-to-face discussion with the witness, revealed that participants' enhanced propensity toward anger when they had lost in front of a friend as compared to a stranger was still evident. If nothing else, this suggests that the anger-intensifying effect of close others that we have identified under highly controlled conditions does not quickly evaporate in less constrained circumstances.

General Discussion

The results of the present five experiments reveal that individuals' affective and behavioral reactions to experiences that have the potential to trigger angry feelings can be intensified by merely perceiving that a psychologically close other is privy to what happened, possibly at least in part as a result of their imaginings of the close other's empathy for them. Conversely, when individuals believe that psychologically distant others are witness to such experiences, their anger can instead be attenuated. Thus, individuals are led down distinct emotional paths merely as a function of perceiving psychologically close versus distant others to be aware of their experiences, even in the absence of receiving any cues whatsoever from the ostensible witnesses and indeed even when those witnesses do not really exist. These findings were obtained across operationalizations of psychological closeness in terms of personality and values similarity (Experiments 1 and 2), demographic similarity (Experiments 3 and 4), and type of relationship (Experiment 5), across highly impactful recalled anger-inducing experiences (Experiments 1 to 4) and a minor event staged in the lab (Experiment 5), and across ostensible witnesses who were encountered in online exchanges (Experiments 1 to 4) and real witnesses who were physically present as observers (Experiment 5).

Our results consistently indicated that the intensity of individuals' reactions to angerinducing experiences depended both on whether or not the event was perceived to be witnessed by another person and on whether that person was psychologically close or distant. The results of the mini meta-analysis confirmed that overall both the intensification effect connected to witnessing (versus not) by a close other and the attenuation effect connected to witnessing (versus not) by a distant other were statistically significant. However, the simple effects driving this pattern varied somewhat across the studies. The anger-intensifying effect of witnessing by a close other was most evident in Experiments 1, 2, and 5, whereas the anger-attenuating effect of witnessing by a distant other was most evident for in Experiments 3 and 4. The null effects for the close witness in Experiments 3 and 4 might be understood in terms of the limited potency of demographic similarity for dominant or majority group members in contexts in which their shared group membership is not distinctive. That is, at least in the context of the present research, it may have been the case that demographic dissimilarity served to instantiate feelings of distance more so than demographic similarity served to instantiate feelings of closeness, perhaps because the demographic characteristics shared with the similar other were perceived as too common to create any sense of special bond (see, e.g., Turnbull, Miller, & McFarland, 1990).

With respect to process, individuals reported higher levels of both imagined reactive empathy (i.e., that the other person sympathized with them) and imagined parallel empathy (i.e., that the other person felt the same way that they did) in connection with psychologically close as compared to distant others, and both types of imagined empathy helped account for individuals' feelings of anger when they perceived that the other was witness to their anger-inducing event. Specifically, meta-analyses of imagined reactive and parallel empathy yielded a significant overall effect for the closeness manipulation in each case and further revealed that the overall indirect effect of closeness on anger via imagined parallel empathy was significant in the witness but not the no witness condition; results were similar for imagined reactive empathy.

There are gaps in our understanding here that need to be acknowledged, however. First, although our evidence for the role of imagined empathy is suggestive, it is also indirect and alternative accounts are possible. Second, the results here varied somewhat depending on the specific analytic approach and were stronger for Experiments 1 and 5 than they were for Experiment 3, in which psychological closeness was manipulated in terms of demographic similarity and in which there were no significant effects on the measures of imagined reactive and parallel empathy that were included. In light of this we do not have evidence for underlying process specifically in reference to the effects of demographic similarity, which were driven by dissimilar witnesses.

We suspect that when the witness is psychologically distant – and perhaps especially when the witness is an outgroup member – individuals' imaginings of the witness's cognitions may play a more important role than their imaginings of the witness's affect. For example, in these cases individuals' thoughts might turn to how the anger-inducing event might seem insignificant to the witness or how the witness might see them as responsible for what happened and thus view their anger as less warranted. In connection with this it is possible that for a psychologically distant witness individuals' perceptions of the person's actively critical thoughts and judgments are more primary than their perceptions of the person's affective indifference. This possibility is broadly consistent with research and theory on meta-stereotype activation, which underscores individuals' readiness to consider an outgroup member's potentially distinct perspective on themselves (e.g., Vorauer, Hunter, Main, & Roy, 2000). Nonetheless, and especially in view of the highly intertwined nature of perspective-taking and empathic processes (e.g., Vorauer, 2013) and the post hoc nature of our theorizing here, this possibility is speculative and remains a question for future research. It will also be important for future research to probe the generalizability of the anger-attenuating effects obtained here to different outgroup audiences.

With respect to downstream behavioral implications, the meta-analysis of indirect effects revealed that psychologically close witnesses had a positive indirect effect on aggressive inclinations through the intensified feelings of anger they triggered, whereas psychologically distant witnesses instead had a negative indirect effect on aggressive outcomes as a function of their dampening effect on anger. The evidence for behavioral implications of psychologically close witnesses was notably stronger in Experiment 2, in which participants wrote messages describing what they would say to the perpetrator(s) if they could and their messages were coded for verbal aggression in the form of insults. The stronger results here could be because the witnesses are readily imagined for the behavioral response as well as the triggering event. Further, taking the leap of expressing anger toward a perpetrator on one's own initiative (as was involved in the open-ended measure in Experiment 2) seems particularly effortful and proactive and likely to be contingent on the circumstances. For this reason as well the effects of witnesses might be more pronounced for behavior toward perpetrators. However, these possibilities are speculative and remain questions for future research.

Future Directions

Another important avenue for future research centers on the generalizability of the dynamics documented here to events triggering other affective states, such as those that most centrally involve sadness or anxiety. We suspect that the intensification-attenuation pattern associated with close versus distant witnesses is similar for events triggering other affective states, but that the broader experience might be different. For example, the intensification of anger may be more subjectively pleasant or desirable than intensification of more dejection- or anxiety-related emotions and, by the same token, attenuation of dejection- or anxiety-related emotions may be more appealing than attenuation of angry feelings. In addition, at the same time as psychologically close witnesses might intensify negative affect about a specific experience, they likely also foster feelings of being cared for and supported. It is also important to acknowledge that sometimes anger serves a galvanizing role in stimulating efforts to address and rectify injustice, such that the extent to which intensification is problematic may vary across circumstances.

The present research relied quite heavily on a paradigm that involved having individuals write about an anger-inducing experience in an ostensible online exchange. We suspect that this paradigm provided a conservative test of our hypotheses, as there was always the sense that the researchers – however much vague and in the background – were witness to the anger-inducing event, and the writing task itself may have prompted some level of reflection. It will be important for future research to probe the generalizability of the dynamics documented here to other contexts in which individuals have angering experiences. Ethical considerations, especially during the pandemic, led us to hold back from actually creating an anger-inducing experience online. Notably however, Experiment 5, which used a much different paradigm, yielded results

consistent with predictions and the results of the other experiments, and writing about experiences online is a part of everyday life for many individuals.

Conclusion

The present research reveals that merely perceiving a psychologically close other as privy to an anger-inducing experience can lead individuals to feel angrier and respond more aggressively. Indeed, the close other does not need to say or do anything or even actually exist for this intensification effect to arise. This finding may shed light on processes contributing to attitude polarization in online communication and points to the possibility of individuals creating "echo chambers" all by themselves that do not depend on any actual external validation or support. In contrast, merely perceiving that a distant other or outgroup member knows what happened instead reduces individuals' feelings of anger and aggressive reactions. This attenuation effect extends research showing that individuals readily imagine an outgroup member's distinct perspective on them by suggesting that outgroup audiences may sometimes have affective implications that parallel those stimulated by adopting a distanced perspective on the self.

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