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## **Abstract**

Research on malevolent creativity has rarely linked the generation of harmful ideas with their implementation (i.e., malevolent innovation). To explain why people might act upon their malevolently creative ideas, we drew on affective events theory. Specifically, given evidence that aggressive and creative thought events can elicit positive emotions, we argued that generating new and harmful ideas can evoke positive emotional states that make malevolent innovation a more desirable course of action. We first tested our mediational pathway in two studies with different malevolent creativity tasks. Finding only partial support for our predictions in Study 1 ( $N = 126$ ), but full support in Study 2 ( $N = 296$ ), we reflected on our study tasks and suspected that our mixed results may have occurred because the target of ideas in Study 2 embodied more human qualities than in Study 1. Thus, we integrated theory on target personification to see if assigning personhood to a target moderated the malevolent creativity-innovation pathway. We tested our updated model in Study 3 ( $N = 214$ ) and found that the indirect effect of malevolent creativity on the desire to implement ideas (through positive emotions) was indeed conditional upon individuals' personification of a target.

## **Plain Language Summary**

Little research has examined why and when people might act upon their malevolently creative (i.e., new and harmful) ideas. Given evidence that aggression and creativity can both arouse positive emotional states, it may be possible that forming malevolently creative ideas can make people feel more positively about implementing them later on. However, our research findings paint a more nuanced picture, suggesting that the emotional link between generating and implementing malevolently creative ideas only occurs when people see their targets as more humanlike (i.e., they can assign personhood to their targets).

“In order to rally people, governments need enemies...if they do not have a real enemy, they will invent one in order to mobilize us.”

– *Thich Nhat Hanh*

Research and theory on malevolent creativity suggest that ordinary people can generate new and harmful (i.e., malevolently creative) ideas (e.g., Baas et al., 2019; Dumas & Strickland, 2017; Harris et al., 2013; Hudson, 1966; McLaren, 1993; Xu et al., 2021). Perhaps more troubling, anyone under the right circumstances can choose to innovate by using malevolently creative ideas to enact violence, induce terror, or commit crimes (Cropley et al., 2008). In spite of previous theorizing about malevolent creativity, little empirical evidence has demonstrated why people consider *implementing* novel strategies for producing harm (Hunter et al., 2021). Without understanding what fuels people’s desire to implement malevolently creative ideas, we fail to paint a complete picture of how novel threats come to fruition. Establishing a link between malevolent creativity and implementation demands the consideration of internal and external drivers of people’s behavior (Kanfer et al., 2017). Accordingly, we examine two potential factors that make malevolently creative ideas more enticing to implement: affective responses to malevolently creative ideation and the personification of targets.

Internal to individuals, affective events theory (Weiss & Cropanzano, 1996) posits that affect can be a consequence as well as a strong motivator of behavior. With regard to malevolent innovation, evidence suggests that positive emotional states can directly result from both malevolence and creativity. Expressions of aggression, for instance, can be energizing experiences that produce positive affect and catharsis (e.g., Chester, 2017; Eadeh et al., 2017; Konecni & Doob, 1972). Similarly, creativity can also serve as a vehicle for emotional self-expression (Meisiek, 2004), and creative thought events often produce positive emotional reactions due to their satisfying resolve of complex, ill-defined problems (e.g., Amabile et al.,

2005). In combination, the malevolence and creativity of one's ideas can elicit positive arousal states that raise the likelihood that the person wants to execute them.

There is nuance, however, to the extent that people are emboldened to act upon their malevolently creative ideas. Notably, the personification of targets can increase people's motivation to engage in both benevolent and malevolent forms of targeted behavior (Small & Loewenstein, 2005). Within instances of war and punishment, humans have long personified opponents to justify the use of malevolently innovative tactics against them (McGraw & Dolan, 2007). The reification of enemy groups—be it social groups or state actors—has led to devastating outcomes, in part by motivating people and nations to consider new and violent (i.e., malevolently creative) ideas as viable and necessary tools for defeating a personified “other.” Consider, for example, United States President Harry S. Truman's rhetoric in defense of nuclear war. On August 11<sup>th</sup>, 1945, two days after the United States dropped an atomic bomb on Nagasaki, Japan, President Truman explained, “The only language they seem to understand is the one we have been using to bombard them. When you have to deal with a beast, you have to treat him as a beast” (McCarthy, 1985). In painting Japan as embodied actor with his use of pronouns and analogies, President Truman concluded that extreme violence was justifiable corrective action toward a clear and dangerous target. The idea of an atomic bomb, an innovation of imagination in years past, was not only developed but willingly implemented when the United States President designated another nation as a sentient villain (Castano, 2004).

Taken together, we propose that the generation of malevolently creative ideas can stimulate affective responses that make such ideas more desirable to implement, but this is contingent on the extent that targets are personified. Drawing from psychological research on the identifiable other effect (i.e., the tendency for people to direct more extreme benevolent or

malevolent behaviors toward identifiable human targets than toward groups or anonymous persons; Lee & Feeley, 2016) and theories of target personification from political science (i.e., willfully imposing human characteristics on targets will elicit stronger emotions and attitudes for motivating behavior; McGraw & Dolan, 2007), we argue that the forecasted impact of malevolently creative ideas becomes more vivid and evocative when people view the oppositional targets of their ideas with more clarity and concreteness. As a result, the presence of identifiable and humanized targets can make new and harmful ideas more enticing to act upon. We therefore argue that people become more affectively motivated to implement malevolently creative ideas when those ideas are vividly linked to a personified target.

We tested our propositions in three studies. In our first study, we examined the mediating role of affect in the malevolent creativity-idea implementation relationship. Finding null results, we suspected that the target of our study task prompt may have been too broad to elicit strong effects. We then provided a more specific target to participants in a second study and found support for our predictions. To reconcile these discrepant findings, we conducted a third study to directly test the influence of target personification on the indirect link between malevolent creativity and desire to enact ideas through positive emotions. The results of our third study showed support for our revised (i.e., conditional) predictions, indicating that the indirect effect of malevolent creativity on desire to implement malevolently creative ideas (through positive emotional arousal) only occurred when people ascribed human qualities to their targets.

Our research contributes to the literature on malevolent creativity in several ways. First, we integrate research on aggression and creativity to identify affect as likely outcome of malevolently creative ideation. In doing so, we provide evidence for a mediational pathway that bridges the gap between malevolent creativity and innovation, which explains why people may

transition from ideation to action. This work also paves the way for understanding when people see malevolently creative ideas as actionable. Consistent with the identifiable victim effect (Lee & Feeley, 2016; Small et al., 2007), we find that the way in which people view their opponents may inform the likelihood that they adopt strategies for enacting harm. More specifically, our research shows that the extent that competitors personify their opponents may be indicative of their motivation to use new and unexpected attack strategies.

### **Malevolent Creativity and Innovation**

Malevolent creativity refers to the generation of novel and harmful ideas (Harris & Reiter-Palmon, 2015). Whereas the intent of creative ideas broadly entails solving complex, ill-defined problems in new ways, the central goal of malevolently creative ideation is to conjure new ideas with the potential for harm. Along this vein, malevolent creativity is a special case of creativity in which the utility of an idea lies in its capacity to damage others physically or psychologically. The aim of malevolent creativity may differ from other more traditional forms of creativity, but a common theme among these types of creative behavior is that new, high-risk ideas are often doomed to fail (Hunter & Cushenbery, 2015). Hence, most violent new ideas remain in the abstract and are not developed and implemented as innovations. In other words, people will not always see their malevolently creative ideas through. Psychological research, however, has largely neglected novel idea implementation, especially in relation to malevolent ideas.

To date, few researchers (e.g., Cropley, 2010; Hunter et al., 2021; Xu et al., 2021) have distinguished between malevolent creativity (i.e., the generation of new ideas for deliberate harm) and malevolent innovation (i.e., the implementation of malevolently creative ideas). This distinction is not simply theoretical. Although most people have the capacity for violent ideation



(Hudson, 1966; McLaren, 1993), people do not always possess the willingness and ability to act upon such ideas (Xu et al., 2021). People typically engage in violent behavior when there is adequate justification for aggression (James & LeBreton, 2010), such as a person's level of moral disengagement or a contextual motive for retaliation (e.g., Perchtold-Stefan et al., 2021; Vaes et al., 2012; Xu et al., 2021). Thus, understanding malevolent innovation requires an understanding of the internal and external factors that make violence an attractive option.

### **The Affective Link Between Malevolent Creativity and Innovation**

One potential connection between generating and implementing malevolently creative ideas may be found in the emotional experiences of conjuring aggressive and creative thoughts. Research on the emotional consequences of aggression and creativity have often been examined separately, but in the context of malevolent creativity and innovation, there may be substantive overlap. These two streams of research can both be understood through the lens of affective events theory, introduced by Weiss and Cropanzano (1996), which maintains that specific events can elicit discrete emotional reactions that inform future perceptions or behaviors. One's own thought events and behaviors can constitute affective events, meaning that someone can develop affective responses to their own aggression and creativity. There are substantive reasons (and evidence) to believe that that aggressive and creative ideation can stimulate positive emotions, and that malevolent creativity—a combination of both aggression and creativity—can do the same. Below, we briefly review the separate streams of evidence behind the affective responses to aggression and creativity and then integrate them to form our predictions.

Aggressive behavior has been documented as a mechanism for emotion regulation (Chester et al., 2015; Tamir, 2016). Acts of aggression can activate the brain's reward centers (e.g., Chester & DeWall, 2016) and serve as an "emotional release" for the person engaging in

the behavior (Knutson et al., 2005; Chester & DeWall, 2017). Moreover, subtler forms of aggression such as aggressive ideation tasks can elicit positive emotional states (e.g., Eadeh et al., 2017). This body of research suggests that acting aggressively, or even as much as thinking violent thoughts, can constitute events that spur positive affect. In some cases, aggression can be used as a solution to an unresolved tension.

Expressions of creativity have also been linked to positive emotions. Although much of the literature on creativity and affect focuses on positive emotions' role in stimulating creativity (e.g., Filipowicz, 2006; Isen et al., 1987; Parke et al., 2015; Rego et al., 2014), there is also evidence that creative ideation can induce positive emotions. Amabile and colleagues (2005) found in their study of daily diary entries from 222 employees that experiencing creative thought events at work produced positive emotional responses. Specifically, the authors noted that 86% of the emotional reactions to creative thought events were positive and often related to the satisfaction of solving an everyday problem. Much in the way that aggressive ideation can create positive arousal states, creative thinking can instill feelings of gratification and joy.

Given that both aggressive and creative ideation independently predict positive emotions, it may be reasonable to suspect that malevolently creative ideation would also produce similar effects. Aggressive thoughts and creative thoughts can both be viewed as ideas for solving internal (e.g., the need for emotional release) or external tensions (e.g., an unresolved work problem), and the generation of ideas that are aggressive *and* creative in nature may thus result in feelings of satisfaction and excitement. Stated otherwise, malevolently creative ideation is a thought event that can rouse positive emotional states. The generation of malevolently creative ideas, then, may influence positive emotions:

*Hypothesis 1: Malevolent creativity positively predicts positive emotions.*

Positive emotions typically increase proactive mental frames (Baas et al., 2008; Shin, 2014). For this reason, such emotional states have been theorized to increase promotion-focused tendencies that drive behavior (Baas et al., 2011). Because positive emotional stimulation makes future activity more likely, positive emotions should raise the likelihood that people want to implement malevolently creative ideas. Thus, we predict:

*Hypothesis 2:* Positive emotions positively relate the desire to implement ideas.

The emotional thrill of generating malevolently creative ideas makes the prospect of implementing ideas more desirable to their creators. Hence, one plausible link between malevolently creative ideation and idea implementation is the arousal of positive emotions. We therefore predict:

*Hypothesis 3:* The relationship between malevolent creativity and the desire to implement ideas is mediated by positive emotions.

## Study 1 Methods

### Sample and Design

One hundred and twenty-six undergraduates from a large northeastern university in the United States participated in an online study in exchange for course credit in their introductory psychology course. A power analysis (based on the effect size for an aggression prime on positive emotions from Eadeh et al., 2017) for a multiple regression model (G\*Power,  $1 - \beta = .080$ ;  $\alpha = .05$ ) with five predictors indicated that this sample size met the minimum of 92 participants to detect an effect of  $f^2 = .23$ . The mean age of participants was 19.4 years ( $SD = 1.62$ ), and 65.9% were women. For this online survey-based study, participants first completed an individual differences survey and then performed a malevolent idea generation task, followed

by a questionnaire about their post-task emotional state. Participants concluded the study reporting their desire to implement the idea they generated from the study task. We describe the study protocol in more detail below.

### **Procedure**

The study took place through an online Qualtrics survey administered through the university's participant subject pool. Participants began the online study by reporting their demographic information (i.e., age, gender) and attitudes toward their university and a rival university, and then their average mood within the last 24 hours. Afterward, participants were asked to imagine themselves in a scenario related to a contentious interuniversity rivalry. Building from this scenario, participants were asked to generate ideas to tarnish the image of their school's opponent. The malevolent creativity task thus involved devising a plan to agitate the outgroup broadly defined, and the task did not specify which representatives of the outgroup should be targeted or where the plan should take place. Following the ideation task, participants were asked to report their post-task emotional state. Last, participants reported their interest in implementing their idea.

### **Measures**

**Desire to implement ideas.** For our primary dependent variable, participants reported their desire to implement their malevolent ideas using a single item, "To what extent would you want to implement your plan?" Given that this item corresponds strongly with the definition of our construct of interest, the use of a single item is acceptable (Matthews et al., 2022). Response anchors for this item ranged from 1 (*not at all*) to 5 (*to a very large extent*).

**Malevolent creativity.** To measure the malevolent creativity of ideas generated, four independent raters assessed participants' responses using indices of idea originality, feasibility,

and harm (Amabile, 1982) following similar protocols as Gutworth et al. (2017). The originality and feasibility items were based on Nguyen and Hunter's (2021) measure of creativity, and an additional harm dimension was developed based on previous definitions of malevolence and violence (Harris & Reiter-Palmon, 2015; Horgan, 2013). Items were rated on a 5-point scale and included, "To what extent is this idea original?", "To what extent could this idea be reasonably executed?" and "To what extent would this idea cause harm to people, property, symbols, and processes?" All raters had at least one year of experience working the research lab and were trained on consensual assessment technique (CAT; Amabile, 1982) coding procedures for a minimum of 20 hours. Further, we calculated the intraclass coefficient for interrater reliability based on guidelines from Koo and Li (2016). Interrater reliability was acceptable for originality ( $ICC\ 2,k = .87$ ), feasibility ( $ICC\ 2,k = .93$ ), and harm ( $ICC\ 2,k = .84$ ), and items were averaged together to form a single index of malevolent creativity.

**Post-task positive emotions.** Participants reported their positive emotions following the malevolent creativity task using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). Of particular interest to this study were action-oriented emotions that would theoretically relate to a creative thought event or a motive to implement an idea: interest, excitement, enthusiasm, pride, inspiration, and determination. Items were rated on a 5-point scale with response anchors ranging from *strongly disagree* to *strongly agree*. The scale had high reliability ( $\alpha = .95$ ).

**Control variables.** Our selection of control variables was guided by theory (Carlson & Wu, 2012; Spector & Brannick, 2011). Accordingly, we used control variables that would theoretically influence the relationship between malevolent creativity, positive affect, and desire to implement ideas. First, we controlled for group affinity using the ingroup and outgroup

attitudes measure employed by Paolini et al. (2004) and Wright et al. (1997). Reliabilities for ingroup ( $\alpha = .94$ ) and outgroup attitudes ( $\alpha = .95$ ) were high. Given that our mediator of interest is post-task positive emotions, we also controlled for pre-task mood and post-task negative emotions using the PANAS (Watson et al., 1988). Reliabilities were high for pre-task negative mood ( $\alpha = .87$ ), pre-task positive mood ( $\alpha = .90$ ), and post-task negative emotions ( $\alpha = .92$ ).

### Study 1 Results

Means, standard deviations, reliabilities, and intercorrelations among all Study 1 variables are presented in Table 1. We conducted ordinary least squares (OLS) regression to test our hypotheses. Hypothesis 1 predicted that malevolent creativity would elicit predict post-task positive emotional arousal. Contrary to our expectations, the relationship between malevolent creativity and post-task positive emotions was nonsignificant ( $B = .28, p = .106$ ), showing no support for Hypothesis 1. In support of Hypothesis 2 (i.e., post-task positive emotions predict desire to implement ideas), however, there was a positive and significant relationship between post-task positive emotions and participants' reported desire to implement their malevolent ideas ( $B = .61, p < .001$ ). Finally, we tested Hypothesis 3, our prediction that post-task positive emotions mediated the relationship between malevolent creativity and desire to implement ideas. There was no significant indirect effect of malevolent creativity on desire to implement ideas through post-task positive emotions ( $Boot z = 1.53, p = .125$ ), as the 95% confidence interval included zero (95% CI [-.05, .38]). Thus, we did not find evidence in support of Hypothesis 3, although this was unsurprising given our nonsignificant result for Hypothesis 1.

### Study 1 Discussion

The findings of Study 1 did not align with our prediction that malevolent creativity would influence post-task positive emotions. We did, however, find some support that post-task positive emotions predicted a desire to implement ideas. Following this study, we wondered if our original study task was too broad in scope. Participants in Study 1 generated ideas to perturb an amorphous outgroup in an unspecified setting, which may have been too ambiguous a target to foster excitement about a malevolently creative idea. Considering evidence that people form stronger attitudes toward personified targets (i.e., concrete targets with human qualities; McGraw & Dolan, 2007; Small & Loewenstein, 2005), we conducted a follow-up study to test whether our predictions would hold when participants were presented with an identifiably human competitor. Put differently, it may be the case that participants would feel more positively about their malevolently creative ideas (and more likely to implement them) when faced with a more concrete representations of their outgroup.

## **Study 2 Methods**

### **Sample and Procedure**

Data for this study were collected from 324 undergraduates at a large northeastern university, again in exchange for course credit in their introductory psychology course. Twenty-eight cases were removed from our analyses for failure to meet attention checks or engaging appropriately with the study task, leaving a final sample size of 296 participants. Based on Schoemann et al.'s (2017) Monte Carlo simulation process for determining mediation sample sizes (5,000 sample replications and 20,000 Monte Carlo draws) using the correlations among our primary predictor (i.e., malevolent creativity), mediator (i.e., post-task positive emotions), and outcome (i.e., desire to implement ideas) from Study 1, our sample size sufficiently

exceeded the 250 cases needed given a target power of .80. The average age of participants was 19 years ( $SD = 1.05$ ), and participants were 20.3% men, 78.7 % women, 1.0% nonbinary.

The procedure for Study 2 resembled that of Study 1, except the study task was adjusted to provide a more directly human target. After reporting their demographics, group affinity, and previous day's mood in an initial survey, participants were asked to devise a plan to disrupt the operations of a representative subgroup from the other university. For this task, they were given access to a secure facility within which they could execute their plan. Presenting a target with defined human characteristics allowed participants to design plans with more detail and tangible consequences. Finally, participants reported their post-task emotional states and then their interest in implementing their plan.

### Measures

**Desire to implement ideas.** Participants reported their desire to implement their malevolent ideas on a 5-point response scale (anchors ranged between *not at all* and *to a very large extent*) for the survey item, "To what extent would you want to implement your plan?"

**Malevolent creativity.** Three independent raters assessed the malevolent creativity of participants' responses using indices of idea originality, feasibility, and harm (Amabile, 1982). As in Study 1, items were based on Nguyen and Hunter's (2021) measure of creativity and previous definitions of malevolence and violence (Horgan, 2013; Reiter-Palmon & Harris, 2015). All raters were trained on consensual assessment technique (CAT; Amabile, 1982) coding procedures for a minimum of 20 hours. Across our three raters, reliability was acceptable for originality ( $ICC\ 2,k = .78$ ), feasibility ( $ICC\ 2,k = .67$ ), and harm ( $ICC\ 2,k = .71$ ), and items were again averaged together to form a single index of malevolent creativity.



**Positive emotions.** Participants reported their positive emotions (i.e., interest, excitement, enthusiasm, pride, inspiration, and determination) following the malevolent creativity task using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). Items were rated on a 5-point scale with response anchors ranging from *strongly disagree* to *strongly agree*. The scale had high reliability ( $\alpha = .93$ ).

**Control variables.** We used the same control variables and measures as Study 1. Once again, reliabilities for ingroup ( $\alpha = .95$ ) and outgroup attitudes ( $\alpha = .96$ ) were high. Likewise, reliabilities were high for pre-task negative mood ( $\alpha = .87$ ), pre-task positive mood ( $\alpha = .89$ ), and post-task negative emotions ( $\alpha = .93$ ).

### Study 2 Results

Means, standard deviations, reliabilities, and intercorrelations among all Study 2 variables are presented in Table 3. Predictions were again tested with OLS regression. Consistent with our first hypothesis that malevolent creativity would elicit post-task positive emotional states, we found a positive and significant effect of malevolent creativity on post-task positive emotions ( $B = .51, p < .001$ ). Hypothesis 1 was thus fully supported. We also found evidence in support of Hypothesis 2, which held that post-task positive emotions would positively predict participants' desire to implement ideas ( $B = .68, p < .001$ ). Furthermore, there was a significant indirect effect of malevolent creativity on desire to implement ideas through post-task positive emotions ( $Boot z = 5.10, p < .001$ ) given that the 95% confidence interval did not include zero (95% CI [.22, .48]). Hence, in contrast to Study 1, full support was found for Hypotheses 1-3. Results are summarized in Table 4.

### Study 2 Discussion

Contrary to the findings of our initial study, Study 2 offered full support for our prediction that malevolent creativity predicts a desire to implement ideas through positive emotional arousal. These findings suggest that the generation of new and harmful ideas can indeed stimulate positive emotions, which predict one's desire to carry out their malevolent creativity. However, the disparate results between Study 1 and Study 2 point to a key difference in task context. In this case, we interpret these inconsistencies as being a product of the task context, specifically in relation to the target of ideas generated. We therefore revised our theorizing to account for the potential conditional nature of our previous predictions, and we conducted a third study in hopes of reconciling these discrepancies.

### **The Role of Target Personification**

Given the contrasting findings between Study 1 and Study 2, we expect that a key difference between study tasks lies in the extent that the intended targets of malevolently creative ideas are personified—that is, represented with humanlike characteristics. Whereas participants in our first study plotted against a broad and abstract social group, participants in our second study were asked to generate ideas to reduce the morale of a narrower and identifiable group of actors who represented the broader collective. Having a more human opponent may have evoked stronger emotional reactions and prompted participants to view their targets as deserving recipients of malevolence (Small & Loewenstein, 2005). The degree that targets are viewed as human may play a substantive role in influencing people's desire to implement malevolently creative ideas.

Assigning personhood to targets is a common phenomenon with which political scientists are intimately familiar and can be used to mobilize large groups of people against an otherwise abstract entity. By embodying a broad and amorphous target (such as a political party or nation

state) with human characteristics (e.g., physical attributes, motivations, rational intentions, beliefs), people can better rationalize their motivations to act in favor of, or against, a specified enemy (Castano, 2004; Wendt, 2004). Personifying a broader social group enables people to view their adversaries as actors with intentions that are worthy of opposition. In other words, treating collectives as persons creates the perception that those who represent the group possess antagonistic motives that warrant punishment, leading people to harbor harsher attitudes toward those groups (McGraw & Dolan, 2007; Wendt, 2004).

Psychological research on decision making also offers evidence that people develop stronger attitudes and intentions toward identifiable targets as compared to anonymous, “statistical” targets (i.e., groups or persons who are demonstrably worthy of aid or punishment, but whose identities remain are not revealed). Termed the “identifiable victim effect” or “identifiable other effect” (Lee & Feeley, 2016; Small & Loewenstein, 2005), this literature suggests that people may feel more strongly about punishing those who embody identifiably human qualities (e.g., having a face, name, or physical presence), which are representative of human motives, agency, and deservingness of targeted behaviors. Extending this line of research to the connection between malevolently creative ideation and malevolent innovation, people are likely to see personified targets as more deserving of malevolent acts. Thus, the practice of personification reifies opposing groups and is a powerful force for motivating malevolent behavior toward a target. Based on this theorizing, we expect that target personification influences the extent that malevolently creative ideation induces the positive emotional arousal that drives the desire to implement new and harmful ideas (see Figure 1 for full theoretical model).

*Hypothesis 4:* Target personification moderates the indirect effect of malevolent creativity on the desire to implement ideas through positive emotions. Specifically, the indirect positive effect of malevolent creativity on the desire to implement ideas occurs when target personification is high, but not when it is low.

### **Study 3 Methods**

#### **Sample and Procedure**

For our third study, we again used Schoemann et al.'s (2017) Monte Carlo simulation process for determining mediation sample sizes (5,000 sample replications and 20,000 Monte Carlo draws), this time based on the correlations among our primary predictor (i.e., malevolent creativity), mediator (i.e., post-task positive emotions), and outcome (i.e., desire to implement ideas) from Study 2. The analysis found that we needed 78 cases to achieve a target power of .80. Given that we expected effects in this test to fall somewhere between our first two studies, we estimated that a sample size above 200 may be sufficient. Data were then collected for this online study from 308 undergraduate psychology students. Ninety-four participants failed to complete the study task, leaving a final sample of 214 participants. The average age of participants was 19.1 years ( $SD = 2.32$ ), and participants were 44.4% men, 54.7% women, 0.9% nonbinary.

We developed a new study task for Study 3. Given that our first two studies had different task contexts, a concern with experimentally manipulating our target is that experimental conditions might also differ substantively on the average level of malevolent creativity. Stated alternatively, we wanted to obtain variation in target personification without also inadvertently manipulating our independent variable, malevolent creativity. If an experimental manipulation

affected malevolent creativity, that would suggest a multiple mediation model (i.e., task or target manipulation predicts malevolent creativity, which predicts positive emotional arousal, which in turn predicts a desire to implement ideas), rather than our predicted conditional mediation model (i.e., malevolent creativity and target personification interact to predict positive emotions, which in turn predict desire to implement ideas). In support of this concern, the mean for malevolent creativity in Study 2 ( $M = 2.56, SD = .81$ ) was higher than in Study 1 ( $M = 2.28, SD = .72$ ), suggesting that altering the nature of the task could potentially influence our predictor of interest. To bypass this issue, we presented participants with the same humanlike target object and let them decide whether to assign personhood to their target. Specifically, participants were told to imagine that they had traveled to the territory of a designated outgroup, and they were asked to develop ideas for a device to vandalize the statue of their adversary's esteemed leader, which served as a coveted symbol of pride and history for the outgroup. The act of defacing the statue could involve treating the statue as an inanimate object (e.g., creating device to spray-paint graffiti onto the statue, developing a wrecking ball machine to demolish the statue) or a humanoid target (e.g., creating remote devices to place articles of clothing on the statue, using machinery to remove the statue's body parts). By standardizing the target of ideas while giving participants freedom in approaching the task (i.e., not forcing them to treat their target in a specific way), we allowed malevolent creativity and target personification to vary naturally. Target personification did not relate to malevolent creativity ( $r = -.01, p = .858$ ), suggesting that variation in target personification did not correspond strongly with malevolent creativity or its facets ( $r_{originality} = .12, p = .070$ ;  $r_{feasibility} = .00, p = .990$ ;  $r_{malevolence} = -.12, p = .070$ ). As with Studies 1 and 2, participants began the online study by filling out their demographics, group

affinity, and mood in the previous day, which was then followed by the malevolent creativity task and survey items regarding their post-task emotions and desire to implement their plan.

### Measures

**Desire to implement ideas.** As in the previous studies, participants reported their desire to implement their malevolent ideas using a 5-point response scale (anchors ranged between *not at all* and *to a very large extent*) for the survey item, “To what extent would you want to implement your plan?”

**Malevolent creativity.** Malevolent creativity was assessed by five independent undergraduate research assistants using the same items from Study 1 and Study 2. All raters were trained on consensual assessment technique (CAT; Amabile, 1982) coding procedures for a minimum of 20 hours. Interrater reliability was acceptable for originality ( $ICC\ 2,k = .81$ ), feasibility ( $ICC\ 2,k = .83$ ), and harm ( $ICC\ 2,k = .92$ ), and items were averaged together to form a single index of malevolent creativity.

**Target personification.** Similar to the rating procedures for malevolent creativity, five trained raters evaluated the degree that participants assigned personhood to the target of their malevolent plans. The personification item read, “To what extent did the participant treat their target as person?” and response anchors ranged from 1 (*not at all*) to 5 (*to a very large extent*), indicating how much of participants’ written responses focused on the human features (e.g., clothing, body parts) of their target. Interrater reliability was acceptable ( $ICC\ 2,k = .86$ ).

**Positive emotions.** Participants again reported their positive emotions (i.e., interest, excitement, enthusiasm, pride, inspiration, and determination) following the malevolent creativity task using the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988).

Items were rated on a 5-point scale with response anchors ranging from *strongly disagree* to *strongly agree*. The scale had high reliability ( $\alpha = .94$ ).

**Control variables.** We used the same control variables and measures as Study 1 and Study 2 (i.e., ingroup and outgroup affinity, pre-task mood, and post-task negative emotions). Reliabilities for ingroup ( $\alpha = .94$ ) and outgroup attitudes ( $\alpha = .95$ ) were high. Likewise, reliabilities were high for pre-task negative mood ( $\alpha = .85$ ), pre-task positive mood ( $\alpha = .89$ ), and post-task negative emotions ( $\alpha = .93$ ).

### Study 3 Results

Means, standard deviations, reliabilities, and intercorrelations among all Study 3 variables are presented in Table 5. We mean-centered all variables before analysis and created interaction terms by multiplying the centered malevolent creativity and target personification variables (Aiken & West, 1991). In Study 3, we tested our full theoretical model, which is specified in Hypothesis 4 and predicts conditional (i.e., moderated) mediation. We followed the three-step conditional mediation procedure outlined by Preacher et al. (2007). The procedure first involves establishing relationships between our predictor variables and mediators (i.e., mediator models), then between our mediators and dependent variables (i.e., dependent variable models), and finally, tests of the conditional indirect effects of the predictors on our dependent variables through our mediator. Further, conditional indirect effects require the calculation of compound coefficients that are not normally distributed (Preacher & Selig, 2012; Shrout & Bolger, 2002). Due to the non-normal distribution of our product terms, we estimated conditional indirect effects by computing bias-corrected confidence intervals (CI) based on 5,000 bootstrapped samples (Edwards & Lambert, 2007) using jamovi's (version 2.0.0.0) *medmod* module (based on the *lavaan* R package). All results are summarized in Table 6.

**Mediator model.** For our mediator model, we regressed our mediator variable, post-task positive emotions, onto our control variables and theoretical predictors (i.e., malevolent creativity, target personification, and their interaction). Malevolent creativity and target personification interacted to predict post-task positive emotions when controlling for pre-task mood ( $B = .63, p = .025$ ). Our result from this step suggested that we could proceed to our dependent variable model.

**Dependent variable model.** Our dependent variable model specified the relationship of our control variables, theoretical predictors, and mediator (i.e., post-task positive emotions) with our dependent variable of interest, desire to implement ideas. As expected, post-task positive emotions positively predicted participants' desire to implement their malevolent ideas ( $B = .67, p < .001$ ), lending further support to Hypothesis 2. The significant interaction between malevolent creativity and target personification in our mediator model, in conjunction with the significant effect of post-task positive emotions on desire to implement ideas in our dependent model, together laid the foundation for our full conditional mediation model (Preacher et al., 2007). Stated otherwise, we found sufficient evidence to proceed to a test of our full theoretical model (depicted in Figure 1).

**Conditional mediation model.** Hypothesis 4 described a first-stage conditional mediation model (Edwards & Lambert, 2007) in which malevolent creativity and target personification interact to predict post-task positive affect, which in turn influences a desire to implement a malevolent idea. This constituted the third and final step of the conditional mediation procedure (Preacher et al., 2007). Consistent with our Hypothesis 4, the indirect effect of malevolent creativity on desire to implement ideas through post-task positive affect was conditional upon levels of target personification ( $Boot z = 2.35, p = .019$ ). More specifically, the



confidence interval values for the conditional indirect effect did not include zero at high levels (+1 *SD*) of target personification (*Boot z* = 2.02, 95% CI = [.02, .92] at +1 *SD* of target personification), but did at low levels of personification (*Boot z* = -1.52, 95% CI = [-.68, .09]). Although the effect at high levels of target personification was somewhat weak, we found general support for Hypothesis 4 in that the indirect effect was conditional.

### Study 3 Discussion

Study 3 provided evidence that the indirect effect of malevolent creativity on the desire to implement ideas is not only mediated through positive emotions, but conditional upon the level of target personification. In other words, the positive emotional arousal that participants reported following the malevolent creativity ideation task occurs *only* when they ascribed human qualities to their target, and in turn, positive emotional states predicted participants' self-reported interest in putting their plan into action. It should also be noted that the indirect effect of malevolent creativity on desire to implement ideas at high levels of target personification in Study 3 was weaker than the indirect effect in Study 2, when the target had definitively human characteristics. Thus, the conditional indirect effect found in our third study may be a conservative test of the phenomenon compared to one in which the targets are clearly defined as human. Based on these findings, it appears that the assigning personhood to a target while generating ideas can be highly evocative, making the prospect of implementing a malevolently creative idea more enticing to its creator.

### General Discussion

Across our first two studies, we found mixed evidence for the notion that malevolent creativity can be linked to interest in idea implementation through positive emotions. Our initial study findings indicated that these effects may differ depending on external factors, which we

suspected may lie in the target of people's malevolently creative ideas. Confirming this suspicion, our third study found that the link between malevolent creativity and idea implementation is more nuanced than we initially expected, and our revised theoretical model illustrates the conditional nature of this phenomenon more fully.

Our research draws a critical connection between malevolent creativity and malevolent innovation. The distinction between the generation of malevolently creative ideas and their implementation is practically and theoretically meaningful, yet much of the work within this literature has either neglected the role of idea implementation or conflated ideation with innovation. In recognizing that highly novel violent ideas are only dangerous when they are used for real harm (Hunter et al., 2021), we attempted to identify when and why this might occur. Our findings reveal two key factors influencing the enactment of new and harmful ideas: the extent that personhood is assigned to a target and the excitement stemming from the generation of those ideas. These effects can be explained in part due to the positive emotional arousal that has been shown to occur from both creative and aggressive thought events (e.g., Amabile et al., 2005; Eadeh et al., 2017), and they are seemingly bolstered when targets can be treated with human characteristics. It may be possible that personification can lead people to ascribe qualities such as intentionality and adversarial motives to a target, thereby creating for themselves an enemy that is more worthy of malevolence than would otherwise be the case. More centrally, this suggests that prompting someone to think of new and malevolent acts could very well increase one's likelihood of exploring and acting upon their ideas if a target is portrayed as humanlike. This theoretical explanation aligns with research and theory in political science (e.g., McGraw & Dolan, 2007; Wendt, 2004), perhaps showing the value of integrating knowledge from other disciplines to the study of malevolent innovation and vice versa.

### Limitations and Future Directions

Several limitations should be considered when interpreting our study findings. First, we hesitate to draw firm causal inferences from certain aspects of our results because the causal ordering of our *theoretical* constructs may be imperfect despite our efforts to measure them in causal sequence. Whereas post-task positive affect clearly follows ideation activities, it is possible that people's emotional responses may covary with—but not necessarily produce—a desire to implement malevolently creative ideas. This limitation stems from a common issue in psychological research, namely that the causal interplay between emotions and cognitions are complex, dynamic, and difficult to disentangle (Kross et al., 2007; Mischel & Shoda, 1995).

Second, our studies did not use self-reported malevolent creativity, meaning that we did not show evidence that participants' *perceptions* of malevolent creativity contribute to their emotional arousal. Even so, the benefit of this approach is that it limits reporting biases inherent in purely self-report designs (Podsakoff et al., 2003). For instance, Siemsen and colleagues (2010) noted that common method variance can inflate or deflate bivariate statistical relationships and make interaction effects harder to detect. Future research should consider comparing effects between self-perceived and externally rated malevolent creativity.

Third, we did not measure implementation behavior *per se*. Given that asking people to engage in malevolent innovation is unethical, participants within our study only reported their interest in implementing the ideas they generated. Furthermore, we should also note that self-reported *desire* should not be conflated with *intention*. Wanting to carry out a malevolently creative idea does not inherently suggest that someone plans to do so in the future. In many cases, people may be motivated to avoid the negative consequences of unethical behaviors

(Gutworth & Hunter, 2017), and the decision to act malevolently requires deep rationalization of such behavior (James & LeBreton, 2010; Vriend et al., 2017).

In light of our study findings and limitations, we suggest avenues for future research. The effects of target personification highlight that the perceived elements of a target are highly influential to people's desire to execute malevolently creative ideas. Future efforts should try to explain *why* personification plays such a role, perhaps by measuring attitudes related to personification (e.g., beliefs that the target has adversarial motives, perceived worthiness of malevolence). More work should also investigate the role of different actors in the trajectory from malevolent creativity to malevolent innovation. That is, the people who form highly original malicious ideas are not always the same parties responsible for enacting them (Hunter et al., 2021). The psychological study of malevolent behavior has much to gain from political science and terrorism studies in this regard, as group structures and chains of command may dictate how violent operations unfold (Heger et al., 2012). Broadly, the link between malevolent creativity and innovation are severely understudied, although we acknowledge that this problem also underlies research on more traditional forms of creativity (van Knippenberg, 2017; Watts et al., 2019).

### **Practical Implications**

Alongside its theoretical contributions, this research also has practical utility for security professionals. The findings of our third study suggest that the rhetoric people use to describe their opponents may forecast their endorsement of malevolently innovative acts. More granularly, increasing personification within a group's discourse may signal heightened threat language, which may be predictive of future violence (Choi et al., 2022). On that account,

sentiment and discourse analyses may be useful threat assessment tools for security personnel such as intelligence analysts and military strategists.

### **Conclusion**

The practical impact of malevolent creativity research can be greatly enhanced by drawing connections to indicators of idea implementation. Malevolently creative idea generation is largely futile without adopters who intend to innovate for harm. If the primary concern of novel threats pertains to their actualization and measurable damage, researchers should consider not only what makes new violent ideas more likely, but what raises the risk of malevolent *innovation* as well. Our research takes one step forward in linking ideation activities to the desire to implement malevolently creative ideas, but as a whole, malevolent innovation remains a nascent area of research. We hope that other researchers will follow suit in advancing research that minds the gap between malevolently creative thoughts and actions.

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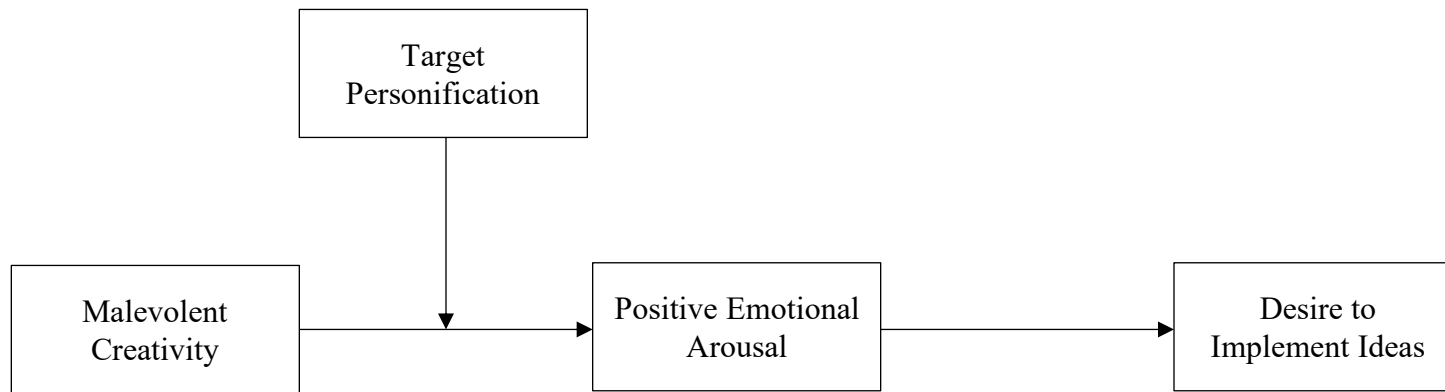
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**Figure 1**  
*Full Theoretical Model*



*Note.* Studies 1 and 2 tested Hypotheses 1-3 (mediation), and Study 3 tested Hypothesis 4 (conditional mediation), the full theoretical model.



**Table 1**  
*Study 1 Means, Standard Deviations, and Correlations*

	M	SD	1	2	3	4	5	6	7	8
1. Ingroup affinity	9.06	2.14	—							
2. Outgroup affinity	4.37	2.31	-0.18 *	—						
3. Pre-task negative mood	2.63	0.97	-0.05	-0.16	—					
4. Pre-task positive mood	3.68	1.13	0.12	0.23 *	-0.07	—				
5. Malevolent creativity	2.28	0.72	-0.04	0.11	-0.20 *	0.13	—			
6. Post-task negative emotions	2.10	1.08	0.03	0.04	0.41 ***	0.07	-0.32 ***	—		
7. Post-task positive emotions	3.10	1.48	0.13	-0.11	0.01	0.42 ***	0.18 *	0.04	—	
8. Desire to Implement	2.71	1.47	0.01	0.03	-0.11	0.19 *	0.27 **	-0.10	0.57 ***	—

*Note.*  $N = 126$ . Reliabilities are presented along the diagonal in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 2**

*Study 1 Regression Results for the Indirect Effect of Malevolent Creativity on Desire to Implement Ideas through Positive Emotions*

Predictor	Post-Task Positive Emotions			Desire to Implement		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Ingroup affinity	.03	.06	.45	-.02	.05	-.33
Outgroup affinity	-.14	.06	-2.52*	.06	.05	1.22
Pre-task negative mood	.07	.13	.58	-.11	.12	-.91
Pre-task positive mood	.58	.11	5.24***	-.13	.11	-1.14
Malevolent creativity	.28	.17	1.63	.29	.16	1.80 <sup>†</sup>
Post-task negative emotions				-.10	.12	-.89
Post-task positive emotions				.61	.08	7.17***
<i>R</i> <sup>2</sup>			.24			.39

Dependent variable	Boot indirect effect	Boot <i>SE</i>	Boot <i>z</i>	Bias-corrected 95% CI	
				Lower	Upper
Desire to Implement	.17	.11	1.53	-.05	.38

*Note.* *N* = 126. Results are based on 5,000 bootstrapped samples. CI = confidence interval.

<sup>†</sup>*p* < 0.10. \**p* < 0.05. \*\**p* < 0.01. \*\*\**p* < 0.001.

**Table 3**  
*Study 2 Means, Standard Deviations, and Correlations*

	M	SD	1	2	3	4	5	6	7	8
1. Ingroup affinity	8.77	2.43	—							
2. Outgroup affinity	3.90	2.16	-0.09	—						
3. Pre-task negative mood	2.65	0.96	-0.18 **	-0.06	—					
4. Pre-task positive mood	3.73	1.04	0.17 **	0.04	-0.08	—				
5. Malevolent creativity	2.56	0.81	0.11	0.04	-0.00	0.08	—			
6. Post-task negative emotions	2.24	1.22	0.04	-0.06	0.28 ***	0.06	-0.00	—		
7. Post-task positive emotions	2.56	1.47	0.21 ***	-0.14 *	0.05	0.31 ***	0.32 ***	0.25 ***	—	
8. Desire to Implement	2.24	1.55	0.14 *	-0.26 ***	-0.00	0.09	0.29 ***	0.03	0.63 ***	—

*Note.*  $N = 296$ . Reliabilities are presented along the diagonal in parentheses.

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 4**

*Study 2 Regression Results for the Indirect Effect of Malevolent Creativity on Desire to Implement Ideas through Positive Emotions*

Predictor	Post-Task Positive Emotions			Desire to Implement		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Ingroup affinity	.07	.03	2.14*	.00	.03	.33
Outgroup affinity	-.11	.04	-3.01**	-.13	.03	-3.89***
Pre-task negative mood	.11	.08	1.32	.01	.08	.13
Pre-task positive mood	.39	.08	5.17***	-.15	.07	-2.21*
Malevolent creativity	.51	.10	5.22***	.18	.09	2.04*
Post-task negative emotions				-.18	.06	-3.01**
Post-task positive emotions				.68	.05	-12.46***
<i>R</i> <sup>2</sup>			.23			.47

Dependent variable	Boot indirect effect	Boot <i>SE</i>	Boot <i>z</i>	Bias-corrected 95% CI	
				Lower	Upper
Desire to Implement	.35	.07	5.10***	.22	.48

*Note.* *N* = 296. Results are based on 5,000 bootstrapped samples. CI = confidence interval.

\**p* < 0.05. \*\**p* < 0.01. \*\*\**p* < 0.001.

**Table 5**  
*Study 3 Means, Standard Deviations, and Correlations*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Ingroup affinity	8.68	2.09	—								
2. Outgroup affinity	4.26	2.30	-0.19 **	—							
3. Pre-task negative mood	2.76	1.04	-0.04	-0.03	—						
4. Pre-task positive mood	3.56	.96	0.21 **	-0.10	-0.13	—					
5. Malevolent creativity	2.53	0.40	-0.05	0.06	-0.08	0.05	—				
6. Target personification	1.72	0.89	0.01	0.00	-0.00	-0.06	-0.01	—			
7. Post-task negative emotions	2.26	1.23	-0.02	0.15 *	0.31 ***	-0.03	0.01	-0.07	—		
8. Post-task positive emotions	2.81	1.40	0.12	-0.12	0.16 *	0.20 **	0.02	0.13	0.20 **	—	
9. Desire to Implement	2.62	1.48	0.06	-0.12	0.17 *	0.03	-0.10	0.23 ***	-0.03	0.63 ***	—

*Note.* *N* = 214. Reliabilities are presented along the diagonal in parentheses.

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001.

**Table 6**

*Study 3 Regression Results for the Conditional Indirect Effect of Malevolent Creativity on Desire to Implement Ideas through Positive Emotions at ±1 Standard Deviation of Target Personification*

Predictor	Post-Task Positive Emotions			Desire to Implement		
	<i>B</i>	<i>SE</i>	<i>t</i>	<i>B</i>	<i>SE</i>	<i>t</i>
Ingroup affinity	.05	.05	1.03	-.00	.04	-.05
Outgroup affinity	-.05	.04	-1.17	-.00	.04	-.11
Pre-task negative mood	.23	.09	2.54*	.14	.08	1.74
Pre-task positive mood	.28	.10	2.86**	-.11	.08	-1.34
Malevolent creativity	.12	.24	.52	-.34	.20	-1.74 <sup>†</sup>
Target personification	.26	.10	2.51*	.22	.09	2.46*
Malevolent creativity × Target personification	.63	.27	2.27*	.16	.24	.68
Post-task negative emotions				-.21	.06	-3.15**
Post-task positive emotions				.67	.06	11.20***
<i>R</i> <sup>2</sup>			.13			.46
				Bias-corrected 95% CI		
Dependent variable	Level of Personification	Boot indirect effect	Boot <i>SE</i>	Boot <i>z</i>	Lower	Upper
Desire to Implement	-1 <i>SD</i> (0.82)	-.30	.20	-1.52	-.68	.09
	+1 <i>SD</i> (2.62)	.47	.23	2.02*	.02	.92

*Note.* *N* = 214. Results are based on 5,000 bootstrapped samples. CI = confidence interval.

<sup>†</sup>*p* < 0.10. \**p* < 0.05. \*\**p* < 0.01. \*\*\**p* < 0.001.