




## Article

# Darkness within: The Internal Mechanism between Dark Triad and Malevolent Creativity

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**Abstract:** The Dark Triad has been found to be associated with malevolent creativity (MC) in terms of trait level, and its underlying mechanism remains unclear. Based on the cognitive–affective processing system theory and the existing studies, the current study aimed to explore the internal mechanism between the Dark Triad and MC behavioral tendencies/performance. The results revealed that the Dark Triad is positively related to MC behavioral tendencies through trait aggression and general creativity behavioral tendencies. Regarding MC performance, the Dark Triad is positively related to the originality of malevolent ideas through MC behavioral tendencies, but this effect is only significant at low-to-medium levels of moral identity. In line with moral identity theory, a higher moral identity may prevent individuals from acting immorally due to their desire to maintain their moral image, which may further suppress malevolent idea generation. Therefore, cultivating moral identity may be an effective approach to weaken the Dark Triad–MC performance association.

**Keywords:** malevolent creativity; Dark Triad; moral identity

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## 1. Introduction

Creativity is the ability to produce novel and useful work (Runco and Acar 2012; Sternberg and Lubart 1996). Traditionally, creativity has been viewed as a purely bright ability that improves people's lives. As a common saying goes, where there is sunshine, there is also shade. Creativity also has a dark side, namely, malevolent creativity (MC), which refers to intentionally causing damage in novel ways (Crompton et al. 2008, 2010; Hao et al. 2020). For example, terrorists display malevolent creativity when they invent new bombs to more effectively massacre citizens.

Given that creativity is, by nature, unexpected and rule-violating, the products of MC can be unpredictable and extremely dangerous (Gill et al. 2013; Gino and Wiltermuth 2014; Wang 2019). Thus, the factors associated with MC have been explored, including aggression (Lee and Dow 2011; Harris and Reiter-Palmon 2015), approach motivation (Hao et al. 2020), and emotional state of anger (Cheng et al. 2021a, 2021b). Previous studies have also demonstrated a creativity–antisociality connection, namely, that creativity and antisocial behaviors can enhance each other (Gino and Ariely 2012; Gino and Wiltermuth 2014). Researchers further moved in a 'darker' direction and focused on the Dark Triad, which is a personality type characterized by self-centeredness, manipulation, and callousness (Jonason et al. 2017; Paulhus 2014). Both creativity and the Dark Triad were found to benefit from lower inhibition (Mednick 1962; Nijstad et al. 2010; Sassenberg et al. 2017; Włodarska et al. 2021), which allows individuals to connect remote concepts (i.e., concepts with loose associations) and then generate highly creative ideas (Mednick 1962; Nijstad et al. 2010; Sassenberg et al. 2017). Moreover, individuals with lower inhibition are more sensitive to reward and find it harder to learn from punishment, which fosters antisocial

traits (Fournier et al. 2021). In line with these previous studies, other studies have found that the Dark Triad is positively correlated with general creativity (Jonason et al. 2015; Kapoor 2015; Kapoor and Khan 2016; Sordia et al. 2022). Additionally, the Dark Triad is positively related to violence, cyberbullying, and a lack of moral values (Moor and Anderson 2019; Muris et al. 2017). These findings imply that the Dark Triad may promote both general creativity and antisocial behaviors. In terms of generating creative and malevolent ideas, MC can also be enhanced by the Dark Triad. To date, studies have preliminarily shown that the Dark Triad is positively associated with MC (Jia et al. 2020; Kapoor and Kaufman 2022; Szabó et al. 2022). However, these studies were limited in terms of the trait level and did not clearly explain the specific underlying mechanism between the Dark Triad and MC. Therefore, the current study placed special emphasis on exploring the internal mechanism between the Dark Triad and MC behavioral tendencies (i.e., trait MC). Furthermore, the relationship between the Dark Triad and malevolent creative performance (MC performance) was examined.

The cognitive–affective processing system (CAPS) has proposed several types of mediating units (e.g., competencies and affective responses) that are activated by situational stimuli and further determine behaviors (Mischel and Shoda 1995). In addition, these units interact with each other. Based on the CAPS, the current study explored which units may participate in the interaction between the Dark Triad and MC behavioral tendencies. MC involves generating creative ideas, while the Dark Triad has been found to be positively associated with general creativity (Jonason et al. 2015; Kapoor 2015; Kapoor and Khan 2016; Sordia et al. 2022). As defined, the core feature of MC is intentional damage, which may be associated with aggression (Cropley et al. 2008, 2010; Hao et al. 2020). Correspondingly, previous studies have shown that MC is positively correlated with aggression (Lee and Dow 2011; Harris and Reiter-Palmon 2015). In addition, the Dark Triad is related to increased violence (Muris et al. 2017). Based on these studies, we assumed that behavioral tendencies related to general creativity and aggression may act as mediators between the Dark Triad and MC behavioral tendencies.

According to the CAPS, the mediating units interact and produce different behavioral responses (Mischel and Shoda 1995). Individuals with higher MC behavioral tendencies are prone to MC behaviors (Hao et al. 2016), which are evaluated by the originality and harmfulness of idea generation (Gao et al. 2022; Qiao et al. 2022). The Dark Triad has been found to be positively related to MC behavioral tendencies (Jia et al. 2020; Szabó et al. 2022); therefore, MC behavioral tendencies may be an underlying mediator between the Dark Triad and MC performance (i.e., originality and harmfulness). Moreover, moral identity theory proposes that individuals with higher moral identity have a strong motivation to maintain their moral image according to their moral standards (Blasi 1983; Pletti et al. 2019). A recent study found that moral reasoning significantly moderates the relationship between MC behavioral tendencies and performance (Zhao et al. 2022). A higher moral identity may prevent individuals from putting a malevolent creative idea into practice. Thus, moral identity may be a moderator of the mediation model involving the Dark Triad, MC behavioral tendencies, and MC performance. Additionally, previous studies have found gender differences in the Dark Triad (Jonason et al. 2015), aggression (Hyde 2014), and MC (Perchtold-Stefan et al. 2021). Moreover, the level of violence decreases with age (Jennings and Reingle 2012). Thus, gender and age were included in the data analysis.

The current study aimed to answer the following question: How is the Dark Triad related to MC at the trait and behavior levels? Based on the above-mentioned studies, we hypothesized that (H1) behavioral tendencies of general creativity and aggression are significant mediators between the Dark Triad and MC behavioral tendencies and that (H2) MC behavioral tendencies mediate the relationship between the Dark Triad and MC performance (i.e., originality and harmfulness), while moral identity moderates the MC behavioral tendencies–performance path.

## 2. Materials and Methods

### 2.1. Participants

A total of 217 Chinese college participants (mean age =  $21.51 \pm 2.23$  years; 166 females) were recruited in the study. The recruiting poster was sent to the open college WeChat group, and anyone interested in the experiment could sign up through a QR code. Three participants were removed due to incomplete data. None of participants had a history of mental or neurological illness. The prior power analysis revealed that the sufficient sample size was 166 to obtain reliable results ( $1-\beta = .95$ ,  $\alpha = .05$ , Effect size  $f = .15$ ; [Chow et al. 2017](#)), which means that the current sample size met the criterion. Written informed consents were obtained from all participants before the experiment. The experimental procedure was approved by the University Committee on Human Research Protection of the East China Normal University (HR 319-2019; HR2-0197-2021).

### 2.2. Measures

#### 2.2.1. Malevolent Creativity Task (MCT)

The MCT was adapted from the realistic presented problem task (RPPT). It was used to measure MC performance by requiring participants to solve open-ended realistic problems in creative and malevolent ways ([Gao et al. 2022](#)). MCT contained 20 randomly sequenced trials, and participants were asked to generate a most novel solution for each problem (e.g., Hong is going to battle with an outstanding player in a tennis final, who is hard to defeat. Please think of a novel way for Hong to make the opponent 'accidentally' injured before the final). The performances on the MCT were evaluated by originality and harmfulness scores. Four trained raters independently assessed the originality (1 = not original at all, 5 = very original) and harmfulness (1 = not harmful at all, 5 = very harmful) scores of each idea on a 5-point scale. The originality and harmfulness of each trial were calculated by averaging the rating scores from the four raters. Then, the final originality and harmfulness scores for each participant were obtained by averaging the scores of all trials. The inter-rater consistency values for originality (inter-rater correlation coefficient, ICC = .86) and harmfulness (ICC = .85) were satisfactory.

#### 2.2.2. Malevolent Creativity Behavior Scale (MCBS)

The MCBS was used to measure malevolent creative behavioral tendencies (MC behavioral tendencies, e.g., When I am treated unfairly, I will retaliate in a different way; [Hao et al. 2016](#)). It contains 13 items that are rated on a 5-point Likert scale (1 = never, 5 = always). The sum of all items was calculated to indicate the level of MC behavioral tendencies, which reflects the potential for malevolent creation. The internal consistency reliability was satisfactory (Cronbach's  $\alpha = .88$ ).

#### 2.2.3. Runco Ideational Behavior Scale (RIBS)

The RIBS was used to measure general creative behavioral tendencies (e.g., I have some ideas for new inventions; [Runco et al. 2016](#)). It contains 19 items that are rated on a 5-point Likert scale (0 = never, 4 = just about every day). The sum of all items was calculated to indicate the level of general creativity behavioral tendencies, which reflects the potential for creation. The internal consistency reliability was satisfactory (Cronbach's  $\alpha = .93$ ).

#### 2.2.4. Buss–Perry Aggression Questionnaire (BPAQ)

The BPAQ was used to measure aggression (e.g., When people disagree with me, I can't resist arguing with them; [Buss and Perry 1992](#)). It contains 29 items that are rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). The sum of all items was calculated to indicate the level of aggression. The internal consistency reliability was satisfactory (Cronbach's  $\alpha = .87$ ).

### 2.2.5. Chinese Version of the Dirty Dozen (DD12)

The DD12 was used to measure Dark Triad personality traits (e.g., I lack remorse; Geng et al. 2015). It contains 12 items that are rated on a 7-point scale (1 = strongly disagree, 7 = strongly agree). The sum of all items was calculated to indicate the level of the composite Dark Triad. The internal consistency reliability was satisfactory (DD12: Cronbach’s  $\alpha = .71$ ).

### 2.2.6. Moral Identity Measures (MIM)

The MIM was used to measure moral personality (Aquino and Reed 2002). Nine words referring to different good characteristics were listed (e.g., friendly), and participants were asked to complete 10 items based on how important these characteristics are to themselves (5-point Likert scale, 1 = strongly disagree, 5 = strongly agree; e.g., I strongly desire having these characteristics). The sum of all items was calculated to indicate the level of moral personality. The internal consistency reliability was satisfactory (Cronbach’s  $\alpha = .75$ ).

### 2.3. Procedure

Upon arrival, each participant was required to sit in front of a table and instructed to complete the demographic questions (i.e., gender and age), MCT, RIBS, BPAQ, DD12, and MIM (all scales were Chinese versions).

Before performing the MCT, participants were explicitly informed that all situations were fictitious in this experiment, and that malevolent ideas generated in this experiment were not related to their personality or level of morality. After completing the experiment, participants were asked whether they were all right (none of them claimed to feel unwell). Besides this, participants were also informed that psychological consultation was available and free for them if they needed it.

## 3. Results

### 3.1. Correlations between MC Performance and Other Variables

Pearson correlation was used to quantify the relations between MC performance (i.e., MCT originality and harmfulness) and other variables (see Table 1). The results revealed that MCT originality was positively correlated with MC behavioral tendencies (i.e., MCBS score;  $r = .30, p < .001$ ), aggression (i.e., BPAQ score;  $r = .16, p = .018$ ), and Dark Triad (i.e., DD12 score;  $r = .16, p = .022$ ); MCT harmfulness was positively correlated with MC behavioral tendencies ( $r = .18, p = .006$ ) and creativity behavioral tendencies (i.e., RIBS score;  $r = .21, p = .002$ ). Moreover, the correlation coefficient between the Dark Triad and MC behavioral tendencies was significantly higher than that between the Dark Triad and creativity behavioral tendencies ( $z = 5.49, p < .001$ ; Diedenhofen and Musch 2015; Hittner et al. 2003).

**Table 1.** Results of Pearson correlation analysis among all variables.

	2	3	4	5	6	7
1. MCT originality	.35 ***	.16 *	.30 ***	.10	.16 *	−.06
2. MCT harmfulness		.07	.18 **	.21 **	.05	−.03
3. Dark Triad			.57 ***	.23 ***	.43 ***	−.26 ***
4. MC behavioral tendencies				.47 ***	.47 ***	−.11
5. Creativity behavioral tendencies					.00	.08
6. Aggression						−.16 *
7. Moral identity						

Note: Dark Triad = DD12 score; MC behavioral tendencies = MCBS score; Creativity behavioral tendencies = RIBS score; Aggression = BPAQ score; Moral identity = MIM score. \*:  $p < .05$ ; \*\*:  $p < .01$ ; \*\*\*:  $p < .001$ .

### 3.2. Regression Analysis on MC Performance

Before the subsequent analysis, all the variables were standardized into Z scores. Hierarchical regression analysis using gender (0 = female, 1 = male), age, and other scale scores as independent variables was performed on MCT originality. The results of Step 3 revealed that MC behavioral tendencies ( $\beta = .31, t = 3.25, p = .001$ ) positively predicted MCT originality (see Table 2).

**Table 2.** Results of hierarchical regression analysis using gender (0 = female, 1 = male), age, and the other scale scores as independent variables on MCT originality.

	Step 1		Step 2		Step 3	
	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>
Gender	.15	2.16 *	.15 *	2.23	.09	1.28
Age	−.07	−1.08	−.05	−.71	−.03	−.40
Creativity Behavioral tendencies MCT			.10	1.37	−.05	−.63
Behavioral tendencies MCT					.31 **	3.25
Dark Triad					−.04	−.46
Trait aggression					.04	.57
$\Delta R^2$	.02 *		.01		.07 *	
$\Delta F^2$	2.63		1.89		5.45	

Note: Dark Triad = DD12 score; MC behavioral tendencies = MCBS score; Creativity behavioral tendencies = RIBS score; Aggression = BPAQ score; Moral identity = MIM score. \*:  $p < .05$ ; \*\*:  $p < .01$ .

Hierarchical regression analysis using gender (0 = female, 1 = male), age, and other scale scores as independent variables was performed on MCT harmfulness. The results of Step 3 revealed that none of these variables significantly predicted MCT harmfulness after controlling for age and gender (see Table 3). The variance inflation factors (VIFs) ranged from 1.02 to 2.08, which meant that multicollinearity did not seriously affect these results (Hair et al. 2010; Xu et al. 2021).

**Table 3.** Results of hierarchical regression analysis using gender (0 = female, 1 = male), age, and the other scale scores as independent variables on MCT harmfulness.

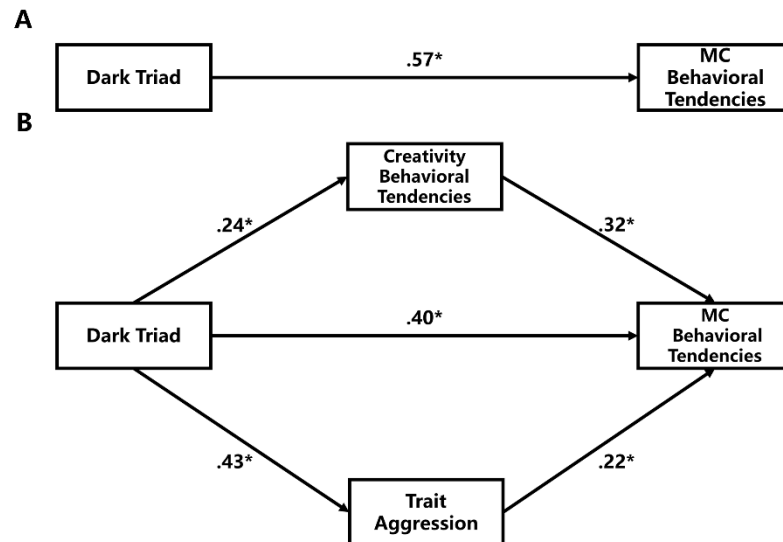
	Step 1		Step 2		Step 3	
	$\beta$	<i>t</i>	$\beta$	<i>t</i>	$\beta$	<i>t</i>
Gender	.01	.11	.02	.23	−.01	−.20
Age	−.24	−3.58 ***	−.20 **	−2.94	−.19 **	−2.82
Creativity Behavioral tendencies MCT			.16 *	2.29	.10	1.35
Behavioral tendencies MCT					.15	1.55
Dark Triad					−.03	−.39
Trait aggression					−.05	−.58
$\Delta R^2$	.06		.02		.01	
$\Delta F^2$	6.48 **		5.25 *		.83	

Note: Dark Triad = DD12 score; MC behavioral tendencies = MCBS score; Creativity behavioral tendencies = RIBS score; Aggression = BPAQ score; Moral identity = MIM score. \*:  $p < .05$ ; \*\*:  $p < .01$ ; \*\*\*:  $p < .001$ .

### 3.3. Relations between Dark Triad and Malevolent Creativity Behavioral Tendencies

Parallel multiple mediation analysis using the Dark Triad as an independent variable and BPAQ and RIBS as mediators was performed on MC behavioral tendencies (see Figure 1). PROCESS 2.16.3 was used to examine the parallel multiple mediation effect (Hayes 2013). The results revealed that both the total effect ( $b = .57, t = 10.24, p < .001$ ; Figure 1A) and direct effect ( $b = .40, t = 7.28, p < .001$ ; Figure 1B) were significant; aggression

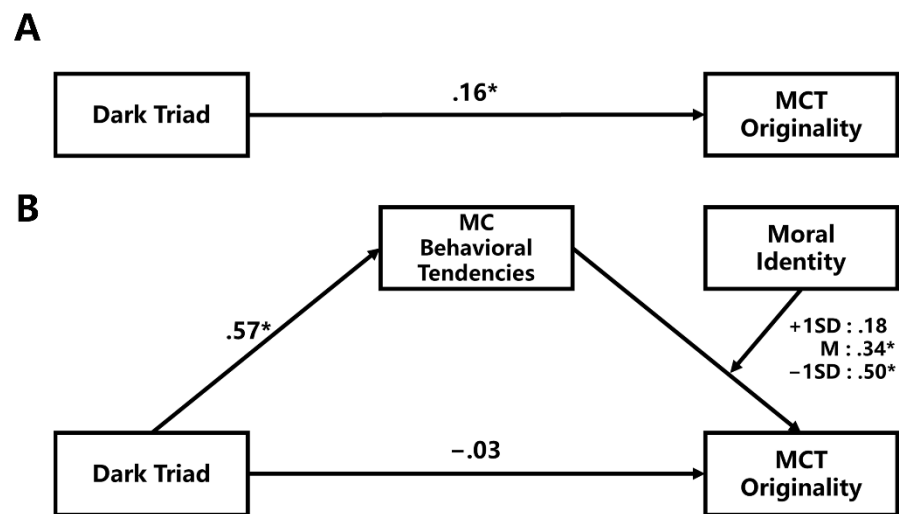
( $b = .10$ ; 95% confidence interval, 95%CI = [.10, .26]) and creative behavioral tendencies ( $b = .08$ ; 95%CI = [.04, .13]) significantly mediated the relation between the Dark Triad and MC behavioral tendencies. The VIF ranged from 1.08 to 1.26, which meant that multicollinearity did not seriously affect the result.



**Figure 1.** Results of parallel multiple mediation on MCBS: (A) the total effect of the Dark Triad on malevolent creativity potential; (B) the parallel multiple mediation model. Dark Triad = DD12 score; MC behavioral tendencies = MCBS score; Creativity behavioral tendencies = RIBS score; Trait aggression = BPAQ score; \*:  $p < .05$ .

### 3.4. Relations between Dark Triad and Malevolent Creativity Behavioral Performance

A moderated mediation model using the Dark Triad as an independent variable, MC behavioral tendencies as a mediator, moral identity (i.e., MIM scores) as a moderator, and MCT originality as a dependent variable was established (See Figure 2). Model 14 of PROCESS 2.16.3 was used to examine whether the mediation effect of MC behavioral tendencies was moderated by moral identity (Hayes 2013). The results revealed that the total effect was significant ( $b = .16$ ,  $t = 2.30$ ,  $p = .022$ ; Figure 2A), whereas the direct effect was insignificant ( $b = -.03$ ,  $t = -.41$ ,  $p = .684$ ; Figure 2B); the moderated mediation effect was significant ( $b = -.09$ ; 95%CI = [-.19, -.01]; Figure 2B); and moral identity significantly moderated the path between MC behavioral tendencies and MCT originality ( $b = -.16$ ; 95%CI = [-.30, -.02]). Specifically, MC behavioral tendencies significantly mediated the relation between the Dark Triad and MCT originality when moral identity was one SD lower than the mean ( $b = .29$ ; 95%CI = [.17, .43]) or equal to the mean ( $b = .19$ ; 95%CI = [.11, .29]); the mediation effect of MC behavioral tendencies was insignificant when moral identity was one SD higher than the mean ( $b = .10$ ; 95%CI = [-.02, .21]). The variance inflation factors (VIFs) ranged from 1.07 to 1.58, which meant that multicollinearity did not seriously affect these results.



**Figure 2.** Results of moderated mediation analysis on MCT originality: (A) the total effect of the Dark Triad on MCT originality; (B) the moderated mediation model. Dark Triad = DD12 score; MC behavioral tendencies = MCBS score; Moral identity = MIM score; \*:  $p < .05$ .

**4. Discussion**

The current study investigated the internal mechanism between the Dark Triad and MC (i.e., MC behavioral tendencies and MC performance). We observed that MC behavioral tendencies were positively correlated with the Dark Triad, aggression, and general creative behavioral tendencies. Moreover, the correlation coefficient between the Dark Triad and MC behavioral tendencies was higher than that between the Dark Triad and general creative behavioral tendencies. The results further revealed that the Dark Triad was related to MC behavioral tendencies through both aggression and general creative behavioral tendencies. Regarding MC performance, only MC behavioral tendencies positively predicted MCT originality after controlling for age and gender. Mediation analyses revealed that MC behavioral tendencies significantly mediated the relationship between the Dark Triad and MCT originality; the mediation effect of MC behavioral tendencies was only significant in low-to-medium levels of moral identity.

The results showed that the Dark Triad was significantly correlated with general creativity and MC behavioral tendencies, which was consistent with the previous findings (Jia et al. 2020; Kapoor and Khan 2016; Sordia et al. 2022; Szabó et al. 2022). Both the Dark Triad and creativity involve disinhibition, allowing individuals to be more antisocial and to connect remote ideas (Fournier et al. 2021; Mednick 1962; Nijstad et al. 2010; Sassenberg et al. 2017). Additionally, the results revealed that the positive correlation between the Dark Triad and MC behavioral tendencies was significantly stronger than that between the Dark Triad and general creative behavioral tendencies. MC is ‘eviler’ than general creativity due to its core feature of causing deliberate damage (Cropley et al. 2008, 2010; Hao et al. 2020), which may imply that MC is closer to an ‘evil trait’ such as the Dark Triad. Besides this, this result may suggest that individuals with higher Dark Triad not only tend to be more creative, but also may have an increased tendency to perform MC.

Parallel multiple mediation analysis found that the relationship between the Dark Triad and MC behavioral tendencies was mediated by both aggression and general creative behavioral tendencies. This result partly supports our hypothesis (i.e., H1). Researchers have demonstrated that individuals with higher aggression tend to generate more harmful ideas in general creativity tasks (Lee and Dow 2011). A higher Dark Triad score is positively related to higher trait aggression, which may increase the tendency to generate harmful ideas. As a subtype of creativity, MC also pertains to finding creative solutions (Cropley et al. 2008, 2010; Hao et al. 2020). A previous study found that behavioral tendencies related to general creativity positively predicted MC behavioral tendencies (Hao et al. 2020). This result may therefore suggest that the Dark Triad stimulates general creativity and

continues to foster the potential to design original evil plans. Taken together, the Dark Triad allows individuals to be more aggressive and creative so that it is easier to generate both malevolent and novel ideas, which further cultivates MC behavioral tendencies. Furthermore, weakening Dark Triad–aggression or Dark Triad–general creativity links may be useful to restrict the positive effect of the Dark Triad on MC.

At the behavioral level, MC behavioral tendencies positively predicted MCT originality (after the effects of age and gender were controlled for) and fully mediated the relationship between the Dark Triad and MCT originality. In addition, moral identity significantly moderated the path of MC behavioral tendencies–MCT originality in the mediation model. This supports our hypothesis (i.e., H2). The Dark Triad refers to self-centeredness, manipulation, and callousness (Jonason et al. 2017; Paulhus 2014). These ‘evil’ features are bonded to the potential for malevolent creation, which is a possible explanation for the positive correlation between the Dark Triad and MC behavioral tendencies (Jia et al. 2020; Kapoor and Kaufman 2022; Szabó et al. 2022). Thus, MC behavioral tendencies could be converted into actual MC performance (Hao et al. 2016), namely, positively connecting to the originality of malevolent creative ideas. However, the path of MC behavioral tendencies–MCT originality is only significant when moral identity is low or medium, which is in line with moral identity theory (Blasi 1983; Pletti et al. 2019). A higher moral identity motivates individuals to act morally so as not to harm their moral image. In addition, research has found that individuals with higher levels of moral reasoning are less prone to putting their MC ideation into practice (Zhao et al. 2022). Therefore, moral identity may weaken the positive relation between social aversive traits (i.e., the Dark Triad and MC behavioral tendencies) and the originality of malevolent ideas. Unexpectedly, this moderated mediation model was only suitable for MCT originality and not for MCT harmfulness (inconsistent with H2). This result may imply that MC behavioral tendencies (measured by the MCBS; Hao et al. 2016) are more closely associated with the capacity to generate original malevolent ideas. Harmfulness may be more closely related to other factors, such as dehumanization and high neuroticism (Allen et al. 2018).

In summary, the findings of the current study support CAPS and moral identity theory. Individuals with higher levels of Dark Triad personality traits tend to have higher aggression and general creativity behavioral tendencies, which then further cultivate their MC behavioral tendencies. At the behavioral level, MC behavioral tendencies may be closer to the originality than the harmfulness of malevolent ideation. The Dark Triad promotes MCT originality by fostering MC behavioral tendencies, but this mediation effect is only significant with low-to-medium moral identity. Based on the above-mentioned results, cultivating moral identity may be an effective way to prevent MC performance. Beyond the laboratory, MC performance in natural settings should be further investigated in the future. However, several limitations should be mentioned: (1) almost 76% of participants were female, so future studies should include more male participants; (2) only explicit aggression was explored, but implicit aggression could also be an effective source of malevolent creation; and (3) in addition to moral identity, moral reasoning and moral emotions should be further investigated in future studies.

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.



**Data Availability Statement:** The data presented in this study are available on request from the corresponding author. The data are not publicly available due to [the participant privacy and the data is only to be made available via a request with a formal data sharing agreement and the approval from the requesting researcher’s local ethics committee].

**Conflicts of Interest:** The authors declare no conflict of interest.

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