Malevolent Creativity among students at the University of Khartoum and the differences according to the variables of age, academic achievement, gender, and academic subject

الفروق في الإبداع المؤذي لدى طلاب جامعة الخرطوم تبعا لمتغيرات العمر والتحصيل الدراسي والجنس والمادة الدراسية

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• المستخلص :

تكشف هذه الدراسة عن الإبداع المؤذي، وذلك من خلال تطبيق مقياس حباب للإبداع المؤذي (HMCS) للتعرف على مدى تكرار الإبداع الخبيث وأبعاده ("إيذاء الناس"، و"الكذب" و "التحايل") وسط الطلاب السودانيين، وتم اختيار عينة من طلاب جامعة الخرطوم (ن = ٥٧٩) بطريقة عنقودية عشوائية، و هدفت الدراسة إلى التعرف على العلاقة بين الإبداع المؤذي والعمر، والجنس، والموضوع الدراسي، والتحصيل الدراسي، وتم استخدام أسلوب التحليلي المقارن وتم تحليل البيانات باستخدام برنامج SPSS. أظهرت النتائج فيما يتعلق بالبعدين الأول والثالث "إيذاء الناس" و"التحايل"، أن هناك فروقاً ذات دلالة إحصائية بين متوسط درجات أفراد العينة والمتوسط الفرضي لمجتمع الدراسة، وكانت الفروق لصالح متوسط أفراد العينة في البعد الأول "إيذاء الناس"، بينما الفروق في البعد الثالث "التحايل" كانت لصالح المتوسط المفترض لأفراد المجتمع المحدد بـ (٢.٥)، في حين لا توجد فروق ذات دلالة إحصائية بين متوسط درجات أفراد العينة والمتوسط المفترض لمجتمع الدراسة في البعد الثاني "الكذب" و الدرجة الكلية لمقياس الإبداع المؤذي، وكشفت أن العلاقة بين الإبداع المؤذي بأبعاده و العمروهي علاقة ذات دلالة إحصائية ، وأن العلاقة بين درجات الإبداع المؤذي وأبعاده والمعدل الدراسي علاقات عكسية وذات دلالة إحصائية ولكنها ضعيفة، ما عدا وبعد " التحايل" كانت العلاقة عكسية وغير ذات دلالة إحصائية، ووجدت فرق ذو دلالة إحصائية في بعد "إيذاء الناس " لصالح الذكور، بينما لا توجد فروق ذات دلالة إحصائية بين الذكور والإناث في بعدي "الكذب والتحايل" ومجموع الإبداع المؤذي، و أن هناك فروق ذات دلالة إحصائية في بعد " الإيذاء" بين طلاب الكليات المختلفة.

الكلمات المفتاحية : الإبداع المؤذي – طلاب جامعة الخرطوم .

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Funding
The authors are thankful the Deanship of Scientific Research at the University of Tabuk for funding this work through Research no. s-1440-0287.

Abstract

This study explored malevolent creativity by a random cluster method sample was selected from the students of the Central campus at Khartoum University (n=579) Habab Malevolent Creativity Scale (HMCS) was applied to identify the frequency of malevolent creativity with its dimensions of hurting people, lying, and playing tricks among the study sample. Furthermore, the study aimed to identify the relationship between malevolent creativity and age, gender, academic subject, and academic achievement. and comparative analytical survey method was used and data was analyzed using the SPSS program. The results with regard to the first and third dimensions, "hurting people" and "playing tricks," that there are statistically significant differences between the average scores of the sample members and the hypothetical average of the study population, and the differences were in favor of the average of the sample members in the first dimension, "hurting people.", and While the differences in

the third dimension"playing tricks," were in favor of the hypothesized average for community members defined as (2.5), While there are no statistically significant differences between the average scores of the sample members and the hypothesized average of the study population in the second dimension "lying" and the total score of the malevolent creativity scale, The relationship between malevolent creativity with its dimensions and age, It is a significant, relationship between the degrees of malevolent creativity, its dimensions, and the academic average are weak, inverse relationships and statistically significant, except after fraud, the relationship was inverse and not statistically significant, that there was a statistically significant difference in the hurting people dimension in favor of males, while there were no statistically significant differences between males and females in the lying and playing tricks dimensions and total malevolent creativity, that there are statistically significant differences at the dimension of harm among students of different colleges.

Key words : Malevolent Creativity - students at the University of Khartoum

Introduction

Hao, et al (2016), and (Osman, 2022) define malevolent creativity as the ability of individuals to produce the largest, diverse and unique number of ideas, behaviors and emotions that are devoid of morals and characterized by deception, lying and harm, whether intentional or unintentional. Malevolent creativity is a concept that has witnessed widespread controversy among specialists, with some arguing that creativity is only positive and useful (Cropley, Kaufman, & Cropley, 2008).. The first to translate the concept of malevolent creativity and transfer it from Western studies to the Arab environment and to conduct extensive surveys about it was Osman (2022). Osman analyzed the content of Western studies on malevolent creativity and recommended studying it in the Arab

environment. Later, AL-Mahdawi et al. (2022) conducted a study to reveal individual differences among Sudanese males in malevolent creativity.

For some researchers, the malevolent creativity concept is so bizarre that they deny its existence, although throughout history they accept the association of creativity with madness. People need more time to absorb creativity of harm or evil. The malevolent creativity concept makes it necessary to reconsider pillars of knowledge about creativity. If creativity, in its general sense, results from the interaction of cognitive processes and the environment in which the individual acts and leads to new and effective products, the opposite is true for malevolent creativity (Katz, l. 2018).

Malevolent creativity occurs when an individual has high levels of intelligence and creativity and lacks values, morals and insight. Studies on malevolent creativity have revealed that it has many examples, including atomic bombs, destructive weapons, biological weapons, torture practices, money laundering and fraud, creative terrorist attacks, deliberate harm, and the harm that scientific and technological innovations can cause. However, the psychological origins of malevolent creativity are poorly addressed and not well understood. Anyway, malevolent creativity can be negative, dark, evil, immoral, and harmful (Cropley, 2011, Perchtold et.al, 2021b, Osman, 2022, Dow, 2023).

The Malevolent Creativity Concept

Malevolent creativity refers to deliberate original harmful creative methods (Harris & Reiter 2015). Studies (e.g., Cropley, Kaufman, & Cropley, 2008, Cropley, 2011, Harris, Reiter & Kaufman 2013) proposed a functional model of malevolent creativity stressing that when creativity is intended to harm others, it is called malevolent creativity that can be discerned from creative products. It can manifest itself strongly in the four aspects of creativity, whether these manifestations take the form of mental problems, destructive outcomes, or harmful criminal behavior. Terrorists are often highly creative. Hao et al (2016) define malevolent creativity as high creative thinking abilities that target harming oneself or others. It is linked to the different types of intelligence and personality. It takes different forms that vary in severity starting from lying, deception, and hypocrisy to crimes, AND explosions.

Osman (2022) defines malevolent creativity as the ability to produce large diverse and unique number of ideas, behaviors and emotions that are void of morals and characterized by deception, lying and harm, whether intentional or unintentional.

Factors Affecting Malevolent Creativity

James and Cropanzano (1999) stress the importance of potential environmental and individual influences on creativity, focusing on how they relate to the possibility of directing creativity toward positive or negative purposes. Most previous research has confirmed that creative people

are more likely to engage in socially undesirable or immoral behavior (Cropley, et.all, 2014). Niepel et al (2015) called for further research on the answer to the question 'Does being a creative student likely mean being an unethical decision maker?' Mai et al (2015) reported that there may be a dark side associated with creative thinking in terms of increasing unethical behavior. Palmer et al (2020) revealed that malevolent creativity may be linked to charitable creativity and the strength of motivation among marketing managers and trainers. Kapoor and Kaufman (2022) called for the development of a theoretical framework for malevolent creativity. They suggested there is increasing evidence that creativity can also have a dark side within organizations based on research linking creativity and unethical behavior,

Also, dishonesty may lead to a greater degree of creativity by not adhering to rules (Wiltermuth, et al., 2017, Wiltermuth. 2014, Cropley, et al., 2014). A study by Haslam and Reicher (2007) revealed that ordinary people unconsciously or carelessly commit atrocities. Perpetrators act with ingenuity, creativity, and faith. In a study by Harris and Reiter (2015), three factors were identified that influence the generation of malevolent creativity: implicit aggression, deliberate impulsiveness, and provocation. Risk is often associated with creativity. Creativity may be associated with high-risk conflicts in the social sphere (Hanoch, Runco, Hall, 2017). Realistic open-ended

scenarios reflect the idea that malevolent creativity can be more easily invoked in situations in which individuals are clearly wronged or provoked by others (Baas et al., 2019).

Kyaga (2019) found that creativity is associated with suicide, and that data supported an increased potential for suicide among artists in general, and authors in particular. Kyaga thus contended a relationship between creativity and psychological disorder. Walczyk et al (2008) reported that liars are highly creative.

Perchtold-Stefan et al (2021a) showed that malevolent creativity is positively associated with fluency in conventional creative thinking, as well as with typical self-reported harmful creative behavior in daily life. They found that personality, hostility, and anger explain variance in the ability to implement malevolent creativity. These results suggest that different cognitive and emotional factors may contribute to the expression of malevolent creativity in different ways. Future investigations seeking to further decipher the destructive potentials of individuals toward others may benefit from the behavioral measurement approach adopted for malevolent creativity.

Perchtold-Stefan et al (2023a) found that mood disorders such as depression may facilitate malevolent creative thinking by increasing impulsivity, reducing self-regulation, and prolonging anger. Perchtold-Stefan et al (2021c) found that people who find other people in a state of crying and

despair are motivated at the neuronal level to generate a wide range of harmful thoughts for others. They also found a greater increase in electroencephalogram when seeing others in anger, which was associated with a large production of harmful thoughts.

Analyses (Perchtold, 2022a) revealed that social exclusion had significant effects on individuals' performance in malevolent creativity. The excluded group generated a greater number of vengeful thoughts that were rated as more creative. Perchtold-Stefan et al (2022b) reported that individuals who practice humor in its various comic styles, e.g. sarcasm are able to produce the largest number of harmful creative ideas. The humor of some people had originality and quality in malevolent creativity, especially in humor that aimed to manipulate and control others, which is associated with malicious humor.

Finally, Gao et al (2022) revealed a relationship among the neural associations of generating harmful creative ideas, using neuroimaging techniques for the first time and task-based static and dynamic functional connectivity (FC) analysis across different time periods, which provided insight into the future investigation of malevolent creativity.

Assessment of Malevolent Creativity

The most common tools used to assess malevolent creativity were situation-based scales. Hao et al (2016) developed the malevolent creativity behavior scale (MCBS). The MCBS includes 13 items that measure individuals' malevolent

creativity through the behavior of daily lives. A total of 958 participants from different regions of China completed the MCBS electronically. Cronbach'α coefficient indicated that the MCBS had satisfactory reliability. Exploratory and confirmatory factor analysis revealed that the MCBS had three dimensions: hurting people, lying, and playing tricks. MCBS scores positively correlated with participants' aggression, openness, and extraversion. MCBS scores predicted individuals' malevolent creativity when addressing realistic, open-ended problems. Overall, the MCBS was found to have appropriate psychometric properties.

Meshkova et al (2018) adapted a Russian version of the MCBS. The adaptation was carried out in 2016-2018 on a sample of 458 respondents (convicted of lucrative, aggressive and lucrative, and aggressive violent crimes, employees of law enforcement bodies, football fans; students of Moscow educational institutions of different profiles). The three-factor structure of the adapted scale corresponded to the original MCBS: harm, lies and mean jokes. The analysis of constructive validity revealed significant correlations of the scale with aggression, hostility, and anger. Aggression and hostility proved to be significant positive predictors of malevolent creativity.

Method

The descriptive correlational and comparative analytical survey method was used to describe the malevolent

creativity of a sample of the sample members, to reveal the relationship between malevolent creativity and some of the students' demographic variables, and to extract differences according to some variables.

Study Population

The study population represents university students in Sudan, and the University of Khartoum was chosen as it represents all sectors of society and its characteristics. The University of Khartoum consists of four main campuses: the Colleges of Education campus in Omdurman, the Colleges of Agriculture and Veterinary campus in Shambat Bahri, the Colleges of Medicine Complex in Khartoum, and the Central Colleges campus in Khartoum, About 25,000 male and female students study at the bachelor's level, more than 60% of whom study at the Central campus.

Research Sample

The study sample consisted of (579) male and female students who were selected by a random cluster method. The application was carried out in a group manner inside the classrooms, and some were done individually in the halls or outdoor courtyards with seating and rest areas. Table No. (1) shows the distribution of the sample according to the variables of the study.

Application time period: The application time took 4 weeks. The application began on Saturday, December 3, 2022 AD - and ended on Thursday, December 29, 2022 AD.

Table 1. The characteristics of the research sample

Variable		Frequency	%
Age	18	112	19.3
	19	74	12.8
	20	96	16.6
	21	62	10.7
	22	121	20.9
	23	69	11.9
	24	45	7.8
	Total	579	100.0
College	Engineering	142	24.5
	Science	43	7.4
	Arts	54	9.3
	Administrative Sciences	33	5.7
	Technological Studies	56	9.7
	Economy	51	8.8
	Math Sciences	115	19.9
	Law	85	14.7
	Total	579	100.0
Gender	Males	274	47.3
	Females	305	52.7
	Total	579	100.0
GPA	Low	180	31.1
	Average	142	24.5
	High	257	44.4
	Total	579	100.0

The Research Instrument

The Primary Data form

It was designed to obtain primary information about the participants. It included completion instructions and the demographic variables of the participants.

The Malevolent Creativity Scale

The tool used in the current study was the 48-item Hababb Malevolent Creativity Scale. . The original scale enjoyed good validity and reliability. It achieved eight of the validity indicators that supported the scale scores (Osman et al., 2023, in press). In this study, validity and reliability were examined and the results were as follows.

Validity

To establish the validity of the HMCS, it was checked for internal consistency by calculating correlations among items and their respective dimensions, and among items and the scale's total score. Items of the "Hurting People" dimension correlated with their dimension with correlations ranging between 0.534 and 0.969, and with the scale's total score with correlations ranging between 0.651 and 0.789. Items of the "Lying" dimension correlated with their dimension with coefficients ranging between 0.887 and 0.970, and with the scale's total score with coefficients ranging between 0.763 and 0.839. Items of the "Playing Tricks" dimension correlated with their dimension with coefficients ranging from 0.913 and 0.957, and with the scale's total score with coefficients ranging from 0.672 and 0.853. All correlations are significant at the 0.01 level.

Correlations among dimensions and the scale's total score were also calculated. They ranged between 0.473 and 0.873, all significant at the 0.01 level.

Reliability

The scale's reliability was established by Cronbach's alpha and McDonald's Omega. Cronbach's alpha coefficients for the "Hurting People", "Lying", and "Playing Tricks" dimensions were 0.988, 0.987, and 0.988 respectively. McDonald's Omega coefficients for the three dimensions were 0.989, 0.988, 0.988, and 0.983 respectively.

Statistical Analysis

Statistical devices use in the analysis of data included means, standard deviations, one-sample T test, independent-samples T test, Pearson correlation coefficient, and Kendall's tau test, and one-way analysis of variance, and Tukey test.

Results

The Participants' Level of Malevolent Creativity

To identify the participants' level of malevolent creativity, the one-sample T test was used. The hypothetical population mean is set to (2.5), These results are presented in table 2.

Table 2. The significance level of the participants' performance on the malevolent creativity scale and its dimensions

Dimension	Df	Test value	M	SD	Std. Error Mean	T	Sig.	Interpretation
Hurting people	**578**	**2.5**	**2.33**	**1.33**	**0.055**	**-3.106**	**0.002**	**There are significant differences**
Lying	**578**	**2.5**	**2.56**	**1.48**	**0.061**	**0.930**	**0.353**	**There are no significant differences**
Playing tricks	**578**	**2.5**	**2.73**	**1.48**	**0.061**	**3.724**	**0.001**	**There are significant differences**
Total	**578**	**2.5**	**2.52**	**1.19**	**0.049**	**0.356**	**0.722**	**no There are significant differences**

It is clear from Table (2) with regard to the first and third dimensions, "hurting people" and "playing tricks," that there are statistically significant differences at the level of

(0.01) between the average scores of the sample members and the hypothetical average of the study population, and the differences were in favor of the average of the sample members in the first dimension, “hurting people.” "With an average of (2.33), where (t=-3.106, df=578, p=.002), That is the sample has low “hurting people” that is less than the hypothetical population average, This may be attributed to university laws and regulations restricting the practice of malevolent creativity, and this is consistent with the hypotheses of a relationship between malevolent creativity and breaking the law (Cropley, A & Cropley, 2011). Also, the university environment usually provides justice that can be linked to malevolent creativity, as hypothesized by Clark & James (1999), and students try to appear ethical on campus and their focus is on academic performance, and this is confirmed by the study (Haste, 1993), which It demonstrates the importance of education for citizenship through moral creativity in which actions are characterized by effectiveness, responsibility, and justice. Therefore, we recommend that educational institutions provide programs that cultivate this type of creativity.

While the differences in the third dimension“playing tricks,” were in favor of the hypothesized average for community members defined as (2.5), where (t=.359, df=578, p=≤.001), meaning that the sample had a noticeable fraud that was higher than the hypothesized community

average. This is due to students' search for ways to compete academically, seize opportunities for excellence, pave the way towards the future, and enjoy independence in the midst of limited opportunities, so they have different situations to practice creative deception.

While there are no statistically significant differences at the level of (0.05) between the average scores of the sample members and the hypothesized average of the study population in the second dimension “lying” and the total score of the malevolent creativity scale, where the average scores of the sample members reached (2.56 & 2.52). That is, the sample is normal according to the hypothesized population average. This result can be linked with the study (Silvia, at.al. 2011) that less honest people are characterized by higher degrees of creativity, and the study (Walczyk, at.al., 2008) that creative individuals are higher liars In divergent thinking. The lack of differences in the dimension of lying may be attributed to the connection between lying and the religious value system of society. It is not permissible to declare practicing it and thinking about it inside or outside the university although it is actually practiced.

As for the lack of differences between malevolent creativity and the hypothetical average society, this matter requires more studies to provide in-depth inquiries. This is the first

study that attempts to reveal the concept in society, and this result, in light of the conditions of war that all members of Sudanese society suffer from, requires more in-depth studies in the same field. Wars involve a lot of malevolent creativity (harm, deception, and lying), which is practiced by only two parties to a conflict and millions of ordinary individuals fall victim to it. This is what studies indicate that have linked creativity to the manufacture of atomic bombs, wars, terrorism, and crime (Cropley, Cropley, 2013; Cropley; Kaufman, & Cropley, 2008; Wang, 2018).

This study was conducted before the war on Sudan. Researchers are currently recommending implementing a study on the same community as those examined in the current study, with the same scale and via an electronic application, to reveal whether aggression, provocation, and irritability (Harris & Reiter, 2015), lawlessness (Cropley & Cropley, 2011), and social threat (Bass, et.all, 2019) Justice (Clark & James, 1999), dishonesty, bad morals, murder, plunder, and rape in society on the subjects' scores on malevolent creativity.

The Relationship between Malevolent Creativity and Age

To identify the relationship between malevolent creativity and age, Pearson correlation coefficient was calculated. These results are shown in table 3.

Table 3. The correlations among malevolent creativity and age

Dimension	N	Correlation Coefficient
Hurting people	579	-.134-**
Lying	579	-.108-**
Playing tricks	579	-.084-*
Total	579	-.130-**

*** Significant at the 0.05 level, ** Significant at the 0.01 level**

Table 3 shows that the relationship between malevolent creativity with its dimensions and age. It is a significant inverse relationship, i.e., the older the individual, the lower the score of his/her malevolent creativity, This may be attributed to the development of the students' value system, their involvement in their academic fields, preparation for the future and work, and their awareness of the importance of adhering to the law in order to continue their university career.

The Relationship between Malevolent Creativity and Academic Achievement

To identify the relationship between malevolent creativity and the students' academic achievement, Kendall's tau_b correlation coefficient was conducted. These results are listed in table 4.

Table 4. The correlations among malevolent creativity and academic achievement

Dimension	N	Correlation Coefficient
Hurting people	٥٧٩	-.085-**
Lying	٥٧٩	-.070-*
Playing tricks	٥٧٩	-0.017-
Total	٥٧٩	-.075-*

*** Significant at the 0.05 level, ** Significant at the 0.01 level**

Table (4) shows that the relationship between the degrees of malevolent creativity, its dimensions, and the academic average are weak, inverse relationships and statistically significant, except after fraud, the relationship was inverse and not statistically significant, as the values of the correlation coefficients ranged between (-.085 & -.070), meaning that whenever the academic average was high, but the degrees of malevolent creativity and its dimensions were low. The result may be attributed to the fact that the more the student directs his abilities, ideas, and inclinations towards academic excellence and self-affirmation, the farther away he is from malevolent creativity.

The Relationship between Malevolent Creativity and Gender

To find out gender differences in malevolent creativity and its dimensions, the independent-samples T test was used. Table 5 presents these results.

Table 5. Gender differences in malevolent creativity and its dimensions

Dimension	Gender	Df	M	SD	T	Sig.	Interpretation
Hurting people	Males	559	51.78	28.85	2.352	0.019	Significant difference in favor of males
	Females		46.3	26.95			
Lying	Males	577	26.44	14.58	1.343	.477	No significant difference
	Females		24.79	14.96			
Playing tricks	Males	577	47.94	24.82	1.427	.519	No significant difference
	Females		44.96	25.29			
Total	Males	577	126.13	58.71	2.130	.034	No significant difference
	Females		116.03	55.36			

Table 5 shows that there was a statistically significant difference in the hurting people dimension in favor of males, while there were no statistically significant differences between males and females in the lying and playing tricks dimensions and total malevolent creativity. This result is consistent with some studies that revealed a presence in malevolent creativity depending on gender, and higher malevolent creativity was found in men compared to women in studies (Harris & Reiter-Palmon, 2015; Perchtold-Stefan, Fink, et al., 2021a; Perchtold-Stefan et al.,2022) The study of Perchtold-Stefan et al (2023) showed that men's thoughts are more decisively focused on physical aggression, these results differ from the study (AL-Mahdawi et.al, 2022), which found a slight difference between the sexes in females, but they are consistent with the researchers' interpretations of the hypothesis that males are higher in the Dark Triad traits, which would contribute to malevolent creativity In favor of males (Jonason & Davies, 2018), The study (AL-Mahdawi et.al, 2022) attributed the result of differences in favor of females to the weakness of the MCBS scale in fully detecting malevolent creativity. This study may fill this deficiency by using the HMCS scale, which has eight validity coefficients, and researchers recommend conducting more From studies on different samples to determine the results of differences in malevolent creativity.

The Relationship between Malevolent Creativity and Specialization

To find out differences in students' Malevolent Creativity by specialization, one-way analysis of variance was performed. These results are shown in Table 6.

Table 6. Differences in malevolent creativity by specialization

		Sum of Squares	Df	Mean Square	F	Sig.
Hurting people	**Between Groups**	**12992.915**	**7**	**1856.131**	**2.414**	**.019**
	Within Groups	**439124.010**	**571**	**769.044**		
	Total	**452116.926**	**578**			
Lying	**Between Groups**	**2509.774**	**7**	**358.539**	**1.653**	**.118**
	Within Groups	**123844.001**	**571**	**216.890**		
	Total	**126353.775**	**578**			
Playing tricks	**Between Groups**	**6080.392**	**7**	**868.627**	**1.386**	**.208**
	Within Groups	**357754.489**	**571**	**626.540**		
	Total	**363834.881**	**578**			
Total	**Between Groups**	**36401.515**	**7**	**5200.216**	**1.605**	**.131**
	Within Groups	**1850072.495**	**571**	**3240.057**		
	Total	**1886474.010**	**578**			

Table (6) shows that there are statistically significant differences at the level of significance (.01) in the dimension of harm among students of different colleges,

while there are no statistically significant differences at the level of significance (.05) in the rest of the dimensions and the scale of Malevolent creativity. To know the direction of the difference, the Levene value was extracted to examine the homogeneity of the sample, which appeared statistically significant as an indicator of the lack of homogeneity in the sample. Therefore, the Games-Howell post-test was conducted for multiple dimensional comparisons to verify the direction of the differences, and Table No. (٧) shows this:

Table No. (7) shows the trend of dimensional differences between university colleges

	Mean	Engineering	Sciences	Literature	Administrative	Technical	Economy	Mathematical	Law
Engineering	**53.15**								
Sciences	**55.12**	1.961							
Literature	**52.43**	0.729	2.690						
Administrative	**38.15**	15.003*	16.965*	14.274*					
Technical	**43.57**	9.584*	11.545*	8.854	-5.420				
Economy	**51.92**	1.233	3.195	0.504	-13.770-*	-8.350			
Mathematical	**44.57**	8.590*	10.551*	7.861	-6.414	-0.994	7.356		
Law	**48.00**	5.155	7.116	4.426	-9.848	-4.429	3.922	-3.435	

It is clear from Table No. (7) that there are statistically significant differences between students in the College of Engineering and students in the colleges of the College of Administrative Sciences, the College of Technical Studies, and the College of Mathematical Sciences in favor of the College of Engineering with an average of (53.15),There are

also statistically significant differences between students in the College of Science and students in colleges. The College of Administrative Sciences, the College of Technical Studies, and the College of Mathematical Sciences are in favor of the College of Science with an average of (55.12). There are also statistically significant differences between students in the College of Arts and students in the College of Administrative Sciences in favor of the College of Arts with an average of (52.43). There are also statistically significant differences between students in the College of Arts. Administrative Sciences and College of Economics students favored the College of Economics with an average of (51.92), while there were no statistically significant differences between the rest of the colleges and the College of Law.

Summary of the differences in the dimension of harmful between colleges. Students in the College of Engineering, College of Science, College of Arts, and College of Economics scored higher grades than colleges that had differences between them. It is noted that most of the differences were between colleges according to scientific and literary specialization. There were no differences between scientific and literary colleges except for the College of Administrative Sciences. It is the only college in which differences were found in all colleges except law, but the differences were not in its favor with any of the groups, but rather in favor of another scientific or literary college,

and there were no differences between any of the colleges and the College of Law.

These results require more in-depth studies for interpretation. Researchers are satisfied with explaining the lack of an increase in the degrees of Malevolent creativity in the harmful dimension among law students by interpreting the first hypothesis, which attributes the decrease in students' Malevolent creativity to university regulations and laws. Thus, law students are more aware of the importance of adhering to the law and their responsibility in applying it. Law, justice, and honesty, all of which are variables assumed to be linked to Malevolent creativity (Clark & James, 1999; Cropley & Cropley,2011, Bass,et.all,2019),

Discussion

This study revealed that students at Khartoum University are characterized by moderate degrees of malevolent creativity, low degrees of hurting people, moderate degrees of lying, and high degrees of playing tricks. A statistically significant inverse relationship was found between malevolent creativity with its dimensions and age. The older the student, the lower his/her malevolent creativity, There was also a statistically significant inverse relationship between malevolent creativity with its dimensions and academic achievement, indicating that the higher the students' academic achievement, the lower their malevolent creativity. A statistically significant difference in the hurting people dimension was found in favor of males, while no

significant differences were found between males and females in the lying and playing tricks dimensions or total malevolent creativity.

Statistically significant differences were found among students of different colleges in the hurting people dimension, while no statistically significant differences were found in the other two dimensions or total malevolent creativity. Students from the College of Engineering, Science, and Economics scored higher scores on the victimization dimension, within their groups and there were no differences between any college and the College of Law.

It is difficult to explain these results, as research into malevolent creativity in the Arab environment is still very few. There are almost no Arab studies that have dealt with malevolent creativity except for the studies of Osman (2022) and AL-Mahdawi et al (2022). Globally, despite the large number of studies in the field, few studies have dealt with the relationship between malevolent creativity with its dimensions and the variables of age, gender, specialization, and academic achievement. However, the results of the current study are consistent with the study of Osman (2022) which reported that malevolent creativity is practiced by criminals, terrorists, extremists, and ordinary people in everyday life. It also concurs with the study of Mai et al (2015) which reported that the dark side of creativity entails using original thinking to achieve a selfish, negative, or evil

goal with or without the deliberate intent to harm others. Our results also diverge with the studies of Perchtold-Stefan et al (2021; 2021a; 2021b, 2021c) who developed four situations taken from daily life and found malevolent creativity inherent in ordinary individuals in society, indicating that malevolent creativity can be practiced in the general population without motivates. Perchtold-Stefan et al (2021b) suggest that the complexities of daily life often require creative ideas to successfully deal with negative social situations, and that the high ability to think harmfully may hinder successful dealing with stressful and irritating events, and as a result may lead to a reverse spiral of reinforcement.

The link between malevolent creativity and demographic variables can be explained through what was generally revealed by some studies. Gutworth, et al (2018) found that situational factors may be more influential in shaping malevolent creativity than other factors. Perchtold (2022a) emphasized the role of situational factors in the emergence of malevolent creativity, indicating that any person may resort to extremely harmful thinking under threatening circumstances. Wang (2018) suggested that culture plays a pivotal role in the development and spread of malevolent creativity.

Studies (Harris, et al., 2013; Kapoor & Khan, 2019; Gutworth, et al., 2018) have shown that individuals practice malevolent creativity in original ways, and that they

generate malicious products as a response to the problem. Malevolent creativity is affected by individual differences, environmental and personal factors, and cognitive abilities, especially with regard to the social and emotional content of a particular problem.

Dow (2023) confirmed that lack of empathy may foster malicious behaviors, and that the dark tetrad of personality traits showed higher rates of malevolent creativity due to increased rates of lying, deception, and narcissism. Mitchell and Palmon (2023) reported that openness to new experience was the most predictive of malevolent creativity, followed by honesty-humility and extraversion.

Few studies have addressed the relationship of creativity to the variables addressed in this study, and most of them examined the relationship of malevolent creativity to gender. Perchtold (2022a) noted that there is a greater degree of harm (malice) for thoughts of revenge specifically for women who are socially excluded. Perchtold-Stefan (2021a) reported that gender was significantly associated with malevolent creativity, indicating that men showed higher malevolent creativity than women. Perchtold-Stefan et al (2023b) conducted a study that revealed that women and men have similar malevolent creativity ability, but their underlying brain mechanisms are different. Women exhibited a steep decrease of task-related alpha power from frontal to left central-temporal. Men's malevolent creative ideation was characterized by a more diffuse pattern of task-related alpha power changes. Women's malevolent creative

thinking may more strongly rely on controlled semantic memory retrieval and novel re-combination of social/relationship information, while men may utilize more automatic motor-related imagery that may predominantly facilitate physical revenge ideation. Perchtold-Stefan et al (2023a) also found that malevolent creativity is positively associated with depressive symptoms in women. Dumas and Strickland (2018) found that men tend to produce a larger number of malevolent responses in alternate uses task, which yields important insights into malevolent creativity appearing in undesirable places.

Finally, this study recommends conducting further in-depth objective analysis and extended research into malevolent creativity and its dimensions (hurting people, lying, and playing tricks), and the variables associated with it, e.g., gender, age, specialization, and academic achievement and their interaction with other variables.

Strengths

The strength of this research lies in exploring the construct of malevolent creativity that has received very little research interest in the Arab environment. The world is now facing many dangers that threaten security and peace, the lives of people, and human survival and reconstruction. Malevolent creativity may be one of the causes of these risks. This study attempted to shed light on the variables associated with malevolent creativity, which may contribute to developing plans and programs.

Also among the strengths of this study is the type and response of the students from the Khartoum University. They were highly cooperative, interested, and eager to complete the research questionnaire. This appeared in the way they responded to the researchers.

Weaknesses

One weak point or limitation in this study is that it used a simple and purposeful sample of students from Khartoum University and did not cover all colleges in the university or all Sudanese universities or universities in different countries, which limits the generalizability of the results. However, our results can be considered indicators for developing future hypotheses on broader samples. Furthermore, the study used the HMCS scale, which is a self-report scale. It did not use situational scales or tasks, which are of great importance in revealing malevolent creativity and its potential aspects.

Conclusion

This study revealed the frequency of malevolent creativity among Khartoum University students. It also explored the relation of some demographic variable (e.g. gender and age) to malevolent creativity and reached some interesting findings in this respect. However, malevolent creativity needs further research on larger samples from Sudan and other Arab countries. There also a need to adapt/develop and standardize a situational scale of malevolent creativity to be used further Arab research about malevolent creativity.

Declaration of Competing Interest :

The authors declare that they have no of Competing Interest or personal relationships that could have appeared to influence the work reported in this paper.

Funding Information:

The authors extend their appreciation to the Deanship of Scientific Research at the Ministry of Education in the Kingdom of Saudi Arabia, University of Tabuk for funding this work through Research no. s-1440-0287.

Acknowledgements

The authors extend their appreciation to KINGDOM OF SAUDI ARABIA, Ministry of Education, University of Tabuk, Vice Rector for Academic Affairs Administration of Academic Programs and Study Plans. And Department of Education and Psychology, University of Tabuk , For the facilities they provided to the research team to to complete this work.

And also The authors extend their appreciation to the students in University of Khartoum for their participation in applying the scale of this research.

Ethics Approval:

An official approval was obtained from the Deanship of Scientific Research at the University of Tabuk, where it issued an official letter addressed to all parties outside and inside the university to facilitate the task of the research team to collect the required information. And also, The instructions of the scale were explained and the approval of each respondent was obtained in the primary data form. All sample members were adults over 18 years old

References

- Al-Mahdawi, M., Dutton, E., Osman H., Bakhiet, S., Ali, M., Khair, S. & Madison, G. (2022). Sex Differences in Malevolent Creativity Among Sudanese Students. *Personality and Individual Differences*, 196: 111724.
- Baas, M., Roskes, M., Koch, S., Cheng, Y., & De Dreu, C. K. (2019). Why social threat motivates malevolent creativity. Personality and Social Psychology Bulletin,45(11), 1590–1602.https://doi.org/10.1177/0146167219838551.
- Beaussart, M. L., Andrews, C. J., & Kaufman, J. C. (2013). Creative liars: The relationship between creativity and integrity.Thinking Skills and Creativity,9, 129–134. https://doi.org/10.1016/j.tsc.2012.10.003
- Bochkova, V.N & Meshkova, Natalya (2019) Behavioral Features of Negative and Malevolent Creativity in Adolescents. Psychological-Educational Studies, 11(1), 93-106.doi:10.17759/psyedu.2019110108.
- Cropley, David. H & Cropley, Arthur. (2013) Creativity and Crime: A Psychological Analysis. Publisher: Cambridge University Press. DOI: 10.1017/CBO9781139176118.
- Cropley , D.H. (2011) The Dark Side of Creativity. Reference Module in Neuroscience and Biobehavioral Psychology, Encyclopedia of Creativity (Second Edition). 351-357. https://doi.org/10.1016/B978-0-12-375038-9.00063-7.
- Cropley, Arthur & Cropley, David (2011).Creativity and Law breaking. Creativity Research Journal. 23(4), 313-320 . 39
- Cropley, D. H., Kaufman, J. C., & Cropley, A. J. (2008). Malevolent creativity: A functional model of creativity in terrorism and crime. Creativity Research Journal,20(2),105-115.doi: 10.1080/10400410802059424.
- Cropley, D. H., Kaufman, J. C., White, A. E., & Chiera, B. A. (2014). Layperson perceptions of malevolent creativity: The good, the bad, and the ambiguous. *Psychology of Aesthetics, Creativity, and the Arts*, *8*(4), 400–412. https://doi.org/10.1037/a0037792.
- Dow, Gayle T. (2023) Chapter 5 - The Dark Tetrad and malevolent creativity Creativity and Morality Explorations in Creativity Research 2023, Pages 69-80. https://doi.org/10.1016/B978-0-323-85667-6.00010-4

- Dumas, Denis; & Strickland, Amanda.(2018) From Book to Bludgeon: A Closer Look at Unsolicited Malevolent Responses on The Alternate Uses Task. Creativity Research Journal. 30, 4, 439-450.
- Gao.Zhenni ;Cheng .Linglin ; Li.Junchao; Chen.Qunlin , Hao. Ning (2022) The dark side of creativity: Neural correlates of malevolent creative idea generation, j.neuropsychologia,167. 108164.https://doi.org/10.1016/j.neuropsychologia. 2022.108164.
- Gutworth, M. B., Cushenbery, L., & Hunter, S. T. (2018). Creativity for deliberate harm: Malevolent creativity and social information processing theory. *The Journal of Creative Behavior, 52*(4), 305–322. https://doi.org/10.1002/jocb.155
- Hanoch, Tyagi V; Runco M, Hall SD, Denham (2017)The Risky Side of Creativity: Domain Specific Risk Taking in Creative Individuals. US National Library of Medicine National Institutes of Health. Front Psychol. 3,8-145. doi: 10.3389/fpsyg.2017.00145.
- Hao, N., Tang, M., Yang, J., Wang, Q., & Runco, M. A. (2016). A New Tool to Measure Malevolent Creativity: The Malevolent Creativity Behavior Scale. Frontiers in psychology, 7, 682. doi:http://doi.org/10.3389/fpsyg.2016.00682 .
- Harris, D. J., & Reiter-Palmon, R. (2015). Fast and furious: The influence of implicit aggression, premeditation, and pro-voking situations on malevolent creativity. Psychology of Aesthetics, Creativity, and the Arts,9(1), 54–64. https://doi.org/10.1037/ a0038499.
- Harris, D. J., Reiter-Palmon, R., & Kaufman, J. C. (2013). The effect of emotional intelligence and task type on malevolent creativity. Psychology of Aesthetics, Creativity, and the Arts,7(3), 237–244. https://doi.org/10.1037/a0032139.
- Haslam S. Alexander & Reicher , Stephen (2007) Beyond the Banality of Evil: Three Dynamics of an Interactionist Social Psychology of Tyranny. Personality and Social Psychology Bulletin,33(5),615-622.https://doi.org/10.1177%2F0146167206298570.https://doi.org/10.1016/j.jesp.2015.05.004.
- Haste, Helen.(1993) Moral creativity and education for citizenship, Creativity Research Journal, 6(1), 153-64. doi.org/10.1080/ 10400419309534474.

- James, K., & Clark, K. (1999). Positive and negative creativity in groups, institutions, and organizations: A model and theoretical extension. Creativity Research Journal,12(3), 211–226.448C. M. PERCHTOLD-STEFAN ET AL.
- Jonason, P., & Davies, M. (2018). A gender role view of the dark triad traits. Personality and Individual Differences, 125, 102–105.
- Kaga, Simon; Landén, Mikael; Boman, Marcus; M .Hultman, Christina; Långström, Niklas; Lichtenstein, Paul (2013) Mental illness, suicide and creativity: 40-Year prospective total. Journal of PsychiatricResearch47(1) 83-90.https://doi.org/10.1016/j. jpsychires. 2012. 09.010.
- Kapoor . Hansika , Kaufman .J (2022) The evil within: The AMORAL model of dark creativity ,Psychology, Theory & Psychology,DOI:10.1177/09593543221074326,CorpusID:246454040.
- Kapoor, H. (2015). The creative side of the dark triad . Creativity Research Journal,27(1), 58–67. https://doi.org/10.1080/10400419.2014.961775
- Kapoor, Hansika (2019). Sex differences and similarities in negative creativity .Personality and Individual Differences Volume 142, 1 May 2019, Pages 238-241 https://doi.org/10.1016/j.paid.2018.04.043.
- Katz , l.(2018) Dark dreams and malign creativity. Knowledge Cultures 6(2):64-75. DOI: 10.22381/KC6220185.
- Lazarus, R. S., & Folkman, S. (1984).Stress, appraisal, and coping. Springer. Lee, S. A., & Dow, G. T. (2011). Malevolent creativity: Does personality influence malicious divergent thinking. Creativity Research Journal,23(2), 73–82.
- Mai, ke Michael; P, Aleksander; Ellis, J & Welsh, David T (2015).The Gray Side of Creativity: Exploring the Role of Activation in the Link Between Creative Personality and Unethical Behavior. Journal of Experimental Social Psychology.60,76-85.
- Meshkova, Natalya; Enikolopov, Sergey ; Mitina, O.V; Meshkov, I.A.(2018) Adaptation of the Malevolent Creativity Behavior Scale. Psychological Science and Education 23(6):25-40. DOI: 10.7759/pse.2018230603
- Mitchell .Kevin S. and Reiter-Palmon .Roni (2023) Malevolent Creativity: Personality, Process, and the Larger Creativity Field. In

book: Creativity and Morality. DOI: 10.1016/B978-0-323-85667-6.00004-9

- Niepel , Christoph ; Mustafić, Maida ; Greiff, Samuel & Roberts, Richard D (2015). The dark side of creativity revisited: Is students' creativity associated with subsequent decreases in their ethical decision making?. Thinking Skills and Creativity18,43-52. https :// doi. org/10.1016/j.tsc.2015.04.005.
- Osman. Habab Abdelhiy (2022) Concept and Term: Creativity Malevolent Tabuk University, Journal of Humanities and Social Sciences, Volume 2, Issue 3, pp .1-17.
- Palmer. Caroline , Kraus S. , Ribeiro-Soriano. D (2020) Exploring dark creativity: the role of power in an unethical marketing task, Economic Research-Ekonomska Istraživanja. DOI:10.1080/1331677X.2019.1660907. Corpus ID: 214520800
- Perchtold-Stefan, C.M., Fink, A., Rominger, C., & Papousek, I. (2021b). Failure to reappraise: Malevolent creativity is linked to revenge ideation and impaired reappraisal inventiveness in the face of stressful, anger-eliciting events. Anxiety, Stress, and Coping, 34, 437–449; doi: 10.1080/10615806.2021.1918682.
- Perchtold-Stefan, C.M., Fink, A., Rominger, C., & Papousek, I. (2021a). Creative, antagonistic, and angry? Exploring the roots of malevolent creativity with a real-world idea generation task. The Journal of Creative Behavior, 55, 710–722; doi: 10.1002/jocb. 484.
- Perchtold-Stefan, C.M., Fink, A., Rominger, C., & Papousek, I. (2022a). Social exclusion increases antisocial tendencies: Evidence from retaliatory ideation in a malevolent creativity task. Psychology of Aesthetics, Creativity, and the Arts, 1–12. doi: 10.1037/ aca0000500.
- Perchtold-Stefan,C.M.,Papousek,I.,Rominger,C.,& Fink, A. (2021). Creativity in an affective context: Reappraisal inventiveness and malevolent creativity as extensions of creativity research toward more real-world creative behavior. European Psychologist, 27, 216–226. doi: 10.1027/1016-9040/a000448.
- Perchtold-Stefan, C.M., Rominger, C., Papousek, I., & Fink, A. (2023b). Women and men have a similar potential for malevolent creativity–But their underlying brain mechanisms are different. Brain Research, 1801,148201;doi:10.1016/j.brainres.2022. 148201.

- Perchtold-Stefan,Corinna, Fink , Andreas, Rominger, Christian, Papousek, Ilona (2021c) Motivated to harm others? Prefrontal-posterior coupling in response to other‘s despair and anger is linked to malevolent creativity, Conference PSYCHOPHYSIOLOGY, 2021/10/1, 58, S54-S54. WILEY.
- Perchtold-Stefan. Corinna M.; Rominger, Christian , Fink, Andreas (2023a) Depressive Symptoms are Positively Linked to Malevolent Creativity: A Novel Perspective on the Maladaptive Nature of Revenge Ideation https://doi.org/10.1002/jocb.580
- Perchtold-Stefan. Corinna M.;Fink. Andreas ; Rominger. Christian; Szabo .Eniko , Papousek. Ilona (2022b) Enjoying others’ distress and indifferent to threat? Changes in prefrontal-posterior coupling during social-emotional processing are linked to malevolent creativity ,Brain and Cognition journal homepage: www.elsevier.com/locate/b&c
- Silvia, P. J., Kaufman, J. C., Reiter-Palmon, R., and Wigert, B. (2011). Cantankerous creativity:Honesty–Humility, Agreeableness, and the HEXACO structure of creative achievement. Pers. Individ. Dif. 51, 687–689. doi: 10.1016/j.paid. 2011.06.011.
- Walczyk, J. J., Runco, M. A., Tripp, S. M., and Smith, C. E. (2008). The creativity of lying: divergent thinking and ideational correlates of the resolution of social dilemmas. *Creativity Research Journal.* 20, 3, 328–342. doi: 10.1080/10400410802355152.
- Wang, Michelle Zichun (2018) Malevolent Creativity: A Cross-Cultural Study , Submitted in Partial Fulfillment of the Prerequisite for Honors in the Department of Psychology, Wellesley College.
- Wiltermuth, Scott S; Vincent, Lynne C & Gino, Francesca (2017) Creativity in unethical behavior attenuates condemnation and breeds social contagion when transgressions seem to create little harm. Organizational Behavior and Human Decision Processes. 139, 106-126. https://doi.org/10.1016/j.obhdp.2017.01.006.