Measuring Twisted Thinking among Young University Students

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ABSTRACT

Research Purpose: Measuring twisted thinking among young university students.

Background: The research aimed to reveal the level of twisted thinking among young students at the University of Mosul.

Methodological approach: This study used the descriptive approach on a stratified random sample of 400 male and female students in the second year and different specializations for the academic year (2023-2024). The researchers designed a test to measure twisted thinking and extracted the psychometric properties of the test (validity and reliability)

Findings: The results indicated that the student's scores on the twisted thinking test were high. The arithmetic mean of the research sample on the test was 64.45 with a standard deviation of 3.45. When compared to the hypothetical mean of the test of 60, it became clear that the arithmetic mean was higher and the calculated t value was 9.54, exceeding the tabular t value of 1.96 at a significance level of 5% with 399 degrees of freedom.

Implications: The study highlights the impact of negative thinking patterns represented by twisted thinking patterns on students' academic and social lives and the need to develop positive thinking skills to confront these negative patterns.

Keywords: Twisted thinking; Catastrophic thoughts; Negative filtering thoughts; White or black thoughts; Mind reading.

INTRODUCTION

College students face important health, mental, and academic challenges in their first academic year. This transition period can be stressful, and challenging for students who are unable to cope with academic demands and adapt to the new educational environment, increasingly causing symptoms such as anxiety and depression..., which are linked to their faulty and negative thinking styles (Davis, 2018).

Among these errors is what is known as twisted thinking. Automatically identifying thoughts and recognizing thinking errors play a major role in cognitive behavioral therapy, as individuals tend to make consistent and nonstopping errors in their thinking. They are introduced to the idea that when people feel emotionally distressed, they are often accompanied by opinions that seem believable at the time, but upon closer examination don't always conform to objective reality and aren't helpful to them. Therefore, we find that most of the negative thoughts that agitate them are distorted and unrealistic (Curwen et al, 2000). Accordingly, individuals adopt irrational beliefs and ideas that affect their personal lives and create multiple problems for them. Moreover, their exposure to repeated psychological pressures from the surrounding environment directly or indirectly affected their thoughts and beliefs, making their thinking negative and rigid, and their ideas very narrow (Kadhem and Muhamad, 2021).

Unfortunately, the daily thinking pattern in Arab societies consists of superstitions and fanaticism that cancel free thinking and the ability to question and criticize. Submission to authority or intellectual references also

results in the idea of cancelling the mind's ability to take off and be free, in addition to placing obstacles in the way of thinking based on argument and proof. All of this results in a lack of knowledge, corruption in the method of thinking, inability to research, and negligence in dealing with the laws of the universe, its principles, and its laws (Al-Zagha, 2010).

MATERIALS AND METHODS

Research Tools

Twisted Thinking Test Design: The test consists of 40 situations, the highest score for the test is 80, the lowest score is 40, with a default average of 60. Under each situation there are two options to choose between, and two points were given to option (A) which includes twisted thinking, and in contrast, one point was given to option (B) because it represents non-twisted thinking.

Procedure

Construct validity:

Constructivist validity in measurement occurs when the test used in the measurement is accurately able to evaluate certain hypothetical structures; it also indicates whether the structure itself (scale or test structure) is valid or not; and in empirical research, it indicates whether the procedural definitions used for independent variables as well as dependent variables are correct. (Goodwin and Kerri, 2013), constructivist validity is arguably one aspect of test truthfulness or measure most directly relevant to the question of whether it actually measures the underlying psychological concept or structure involved. While other aspects of validity focus on whether the test appears to measure the same thing as other, more established tests, there is always a possibility that none of them are actually true. In essence, examining constructivist validity involves going back to the first principles and exploring the theoretical ideas that underpin the concept that is measured in depth. For example, a questionnaire scale for "happiness" can be compiled fairly quickly and it will be fairly easy to ensure that it has a high apparent validity. But it will only have high structural validity if the whole psychological concept of happiness is examined statistically, how it is constructed and how psychologists have developed ideas and theories about happiness very carefully. This is an important consideration because it ensures that tests or measures are based directly on conceptual understanding (concepts of the phenomenon studied), rather than simply comparing with other tests or measures that are assumed to be Honest. (Jones and Mark, 2012), and the researcher has verified the validity of the construction in the current research through two methods:

A. Calculation of the coefficient of difficulty, ease and degree of discriminating strength of situations (terminal groups):

This method requires the application of the test to the discrimination sample, and then correcting each paragraph of this test to extract the total score for each person, the researcher arranges the scores of people in descending order, starting from the highest degree for people and ending with the lowest score, then the researcher chooses a percentage (27%) of the forms with the highest scores and is called the upper group (upper group), and the selection of (27%) of the forms with the lowest grades and called the lowest group, in order to identify two groups characterized by the largest size and maximum variation. The values of the vocabulary discrimination coefficient depend on the level of difficulty of the vocabulary, the farther the difficulty coefficient of a particular single from (0.50) by increase or decrease, the lower the maximum value of the coefficient of discrimination, so we should not expect high values for the coefficient of discrimination if the vocabulary of the test is very easy or difficult, and generally if the value of the coefficient of discrimination of the single (0.40) or more, this is evidence that the single is characterized by a good degree between the two terminal groups, and if it is between (0.20-0.40), the distinction of the vocabulary It is okay, and if this value is less than (0.20), its distinction is weak, but if its distinction is zero or negative, this word should be deleted from the test, or carefully reviewed and then modified. (Sulaiman, 2020)

In order to calculate the coefficient of difficulty, ease and degree of discriminatory strength of the twisted thinking test, the following procedures were performed:

- Twisted thinking was applied to a random stratified sample selected numbering (400) male and female students, which is an appropriate sample, i.e. (10) views for each position and the number (40) positions, as

"Nanly" indicated that the range of the sample size of the discrimination paragraphs ranges from five to ten views (individuals) for each paragraph of the scale or test, this is to minimize the impact of chance (Nannally, 1978).

- The students' responses to the test were corrected, and then the data was included and the total scores were calculated, then they were arranged in descending order from the highest grade to the lowest score, and then the percentage of (27%) of the higher scores, which amounted to (108) forms, and the percentage of (27%) of the lowest scores, which amounted to (108) forms, was determined, and this percentage was adopted because it provides the best differentiation for the groups (the upper group and the lower group), the extreme. (Dancey and Reidy, 2011), so the number of questionnaires that were subjected to statistical analysis was (216) questionnaires. After determining the upper and lower groups, the coefficient of difficulty, ease and discriminating strength of each situation of the twisted thinking test was calculated, using the t-test for two independent samples through the Statistical Package for the Social Sciences (SPSS) program. To compare the average scores of the upper group with the average scores of the lower group for each of the test situations, which numbered (40) positions, and the positions that obtained the calculated value (t) equal to the tabular value (1.96) or more, were considered distinct positions for being statistically significant, at the level of (0.05) and at the degree of Freedom (214).

B. Internal consistency the relationship of the position score to the overall score of the test and the relationship of the position score to the overall score of each type of quirky thinking test.

Internal consistency is a measure of how relevant the elements in a test are that aim to measure the same concept to each other. It is measured by the relationship between individual test items or subgroups and the overall test score. For a test to be trustworthy, for example, if the test shows strong internal consistency, a person who performs well on one element must also perform well on the others, because all examinees evaluate the same trait. The method of assessing internal consistency varies depending on the answer form of the test. Typically, tests with multiple response options use Alpha Cronbach for evaluation, while tests with binary responses, such as true/false or yes/no, use the Coder–Richardson formula (either formula 20 or 21) to measure stability. Ensuring internal consistency of test elements before applying them in research is very important. When an instrument measures multiple aspects, it is necessary to ensure consistency between all parts of each of its aspects, and the number of elements, dimensions, patterns and domains of the instrument affect its overall consistency and the value of Cronbach alpha. Acceptable alpha values range from (0.50 ≥ - 0.90), ideal, while below (0.50) is unacceptable, with categories between them indicating varying degrees of acceptability. Low alpha values can be due to the presence of too few test elements, the lack of internal consistency between the positions or elements of that test, or a combination of divergent positions or elements. (Sulaiman, 2020)

As well as finding the relationship between the degree of the pattern and the total score. It was verified by calculating the values of the correlation coefficients between the total score of each type of twisted thinking and the total score of the test, and calculating the values of the correlation coefficients between the score of each test situation with its total score, and using the Pearson correlation coefficient to find the values of the correlation coefficients, and in order to test the significance of the correlation coefficients, the T test coefficient for the correlation coefficients was used, and it was found that the calculated T values were all higher than the value of (t) tabular (1.960) at a significance level (0.05) and a degree of freedom (214), meaning that the correlation coefficients were all a function. Table 15 illustrates this.

Reliability:

The researchers used the re-application method, which is used to refer to the assessment of the stability or consistency of "scores" on a test or measure at different points in time. A measure that correlates to itself over time is a reliable (fixed) measure and therefore a good measure. This is only true when what is being measured is stable over time. Anything likely to be unstable will not lead to good test-and-retest reliability. People's mood is considered temporary, so a good measure of mood is expected to become unreliable over time. Of course, in quantitative psychology, things are usually measured because they are thought to have relatively constant and unchanging characteristics, such as intelligence, thinking, reaction times, etc. (Howitt, 2019), and to extract the stability of the twisted thinking test by the method of application and re-application, the researchers chose a random sample consisting of 100 male and female students, and the test was applied on Wednesday, 8/11/2023. It was reapplied again on 11/22/2023, on the same sample with an interval of 15 days. The stability coefficient

of the twisted thinking test was extracted using Pearson's correlation coefficient to find the correlation between the scores of the two applications. The score of the Pearson correlation coefficient between the two applications was (0.84), which is an acceptable level of stability. Accordingly, the test is ready for application.

THEORETICAL FRAMEWORK TWISTED THINKING

Smith (2022) defined it as: "Patterns of distortion of reality in your perceptions of your world and the events around you; they distort the way you think about what is actually happening without you being aware of it, but if you think about it a little, you will probably see that they do. These patterns consist of the different ways in which the mind distorts the information coming into it. These patterns are: (catastrophic thoughts, negative selective thoughts, black or white thoughts, evidence-rejecting thoughts, overgeneralization thoughts, mind reading, emotional thoughts, unreliable predictive thoughts)" (Smith, 2022).

Reality distortion tools or patterns consist of the various ways in which the mind distorts incoming information. For example, suppose a depressed man is receiving moderate medical care. He is likely to expand this event and turn it into a complete disaster by assuming: "He is worthless as a person," and he tends to exaggerate negative information. This pattern is called "catastrophizing reality." Without the patterns of reality distortion, the truth is simply that the medical care was normal, even though he would have preferred better care. (Smith, 2022) Smith identified eight patterns of reality distortion, which are tools of distorted thinking, and they are:

Catastrophic thoughts:

your mind inflates the hypothesis of unpleasant events and reduces the value and importance of anything positive about yourself, your world, or your future. (Smith, 2022), the term "catastrophism" refers to the imaginary and often involuntary creation of speculative disasters as an expression of materialistic philosophies and forms of interpretation and response to them. The familiar meaning of the word is through "the habit of jumping to the worst possible conclusion", i.e., in the sense of making something out of nothing and exaggerating and overestimating events and situations (Passannante, 2019), and catastrophic thoughts also mean seeing events and situations as disasters (Fatmawati et al., 2022).

The researchers saw that catastrophic thoughts came as a result of false beliefs about events that occurred in the past that we do not have sufficient information about, or our hasty decision-making about them in the face of uncertainty, and because the mind is characterized by filtering thoughts, it worked to generalize and exaggerate events and situations for those events and previous experiences in a negative way that cannot be tolerated, so we use them (catastrophic thoughts) as a strategy that serves preventive thinking to avoid or confront risk. Catastrophic thoughts are irrational, exaggerated fears about negative events or outcomes that are unlikely to Speak.

Negative Filtering Thoughts:

Your mind searches for gloomy, dark, or scary data while screening out more positive information. The nonadvancing outcome? The world (or yourself) seems bleaker or scarier than it is. For example, you get sent home by your boss because you were exposed to someone who tested positive for COVID-19. You assume you've probably been infected, will probably be hospitalized, or will probably die. You call your brother to say goodbye, and he reminds you that you've been vaccinated, you're wearing a mask, and your workplace has increased ventilation. Selective thoughts lead you to the darkest conclusion rather than the most plausible one (Smith, 2022), where you only pay attention to aspects of reality that align with your negative beliefs (Thomas and Theresa, 2020).

Selective thinking is when you concentrate excessively on a single negative aspect, overlooking the broader context. For instance, you might think, "I received one low rating on my review, despite many high ratings, so I must be doing poorly" (Beck, 2011). This mindset leads you to focus almost entirely on the negatives, seldom acknowledging the positives. For example, you might say, "Look at all the people who don't like me" (Leahy, 2017). This intense focus on the negatives causes you to ignore the positives (Kelly, 2019). Your mind acts like a filter, removing all positive personal experiences of any significance (Amilon and Stephanie, 2022).

The researchers believed that our minds are a filter that selects some thoughts over others, and we often prefer negative thoughts over positive ones in situations or events that we encounter. Perhaps the reason for this is that negative experiences are often accompanied by unpleasant feelings that are resistant to forgetting, unlike pleasant experiences. Our thoughts, beliefs, and perceptions shape our reality and affect how we perceive and interpret the world around us. However, not all of our thoughts are accurate or useful.

White or black thoughts:

These concepts originate from childhood, where children with maladaptive perfectionism often think in extremes (all or nothing; black or white), believing their work is either flawless and valuable or flawed and thus entirely worthless. Perfectionist children also tend to transform their desires into demands. They frequently fall into the cognitive trap of focusing solely on unachieved goals and challenges, neglecting to appreciate their successes (Corson, 2019). Striving for perfection can be very challenging or unrealistic when an unattainable standard of achievement is set, leading to a black-or-white thinking pattern where outcomes are seen as either complete success or total failure. Perfectionism is linked to negative traits in life, such as depression, stress, low self-esteem, and failure (Ahmed and Yagmur, 2022).

The researchers saw that the thinking process is polarized in one direction that dominates the other direction, and we often interpret situations and events as either black or white and rarely mix the two directions. The reason for this is that human nature tends to quickly process situations and events, or what the scientist "Daniel Kneman" calls (the mechanism of cognitive ease). Human perception is a phenomenon that includes a wide range of thoughts, emotions, and perceptions. Within this rich fabric of mental experiences, there is a division often referred to as black or white thoughts. These contradictory types of thoughts, characterized by their contrasting qualities and effects, provide valuable insights into the complexities of the human mind.

Thoughts dismissing evidence:

People’s prior beliefs, shaped by their life experiences, fundamentally influence how they process scientific evidence. Especially when the evidence is different from their beliefs, they tend to downplay, reinterpret, or ignore the evidence rather than revise their own assumptions. This motivated reasoning allows individuals to maintain their prior assumptions, even when scientific evidence suggests that they are questionable or wrong (Thomm et al., 2021).

Your mind tends to overlook evidence that contradicts its negative thoughts. For instance, suppose you are preparing a speech and you think that when it comes time to give the speech, you will be very afraid that you will not be able to speak. Your mind automatically rejects the fact that you have given many speeches before and have never been afraid that you will not be able to speak (Smith, 2022). Some individuals tend to seek out or interpret information in a way that confirms the individual’s preconceptions (confirmation evidence), which leads to misinterpreting ambiguous evidence as confirming their current hypotheses (Johnson, 2020). The weight of evidence pertains to factors such as the quantity or relevance of evidence that can either lessen or enhance the impact of evidence strength on altering belief levels. Griffin and Tversky explain the weight of evidence through predictive validity, comparing it to the statistical concept of precision, like the confidence interval around an effect size (Gugerty and Drew, 2020).

Researchers argue that humans are inherently biased creatures. We tend to seek out information and assumptions that confirm our existing beliefs and ignore or reject evidence that challenges those beliefs. These ideas are often shaped by our upbringing, culture, education, and experiences. While assumptions can be useful in helping us make quick decisions and navigate our daily lives, they can also limit our ability to see the world from different perspectives and hinder our growth as individuals and as a society. These ideas can be a major obstacle to our critical thinking and rational decision-making. When we encounter evidence that contradicts our beliefs, our immediate reaction is often to dismiss it, minimize it, or find far-fetched ways to explain it, rather than objectively assessing the evidence and adjusting our beliefs accordingly.

Overgeneralizing thoughts:

When confronted with uncertainty in various situations and events, humans instinctively seek explanations for behavior. This reflects an inherent need to understand and find meaning in the world. One common, though

often flawed and incorrect, approach is to create and adopt stereotypes. These stereotypes are cognitive structures—attitudes that represent exaggerated generalizations about others—manifesting as broad beliefs about situations, thought patterns, behaviors, values, and beliefs (Rudolph et al., 2021).

The ability to generalize information enables organisms to navigate efficiently in a complex and everchanging environment. However, when this generalization is unchecked, it can result in overgeneralization, leading to less optimal behavior. For instance, overgeneralizing negative information is a key feature of anxiety disorders, causing individuals to avoid situations that are somewhat similar to past negative experiences (McMakin et al., 2020). Additionally, overgeneralization involves unfairly attributing a positive or negative trait to all members of a particular group (Morstatter et al, 2021).

The structure of overgeneralization consists of generalized false conclusions about people, situations, or events based on previous experiences (Gavronskaya et al., 2022), and means the belief that a single negative outcome indicates all situations or will occur in all similar situations (Ara, 2017).

The researchers saw that overgeneralization is a common problem faced by many people in general and university students in particular. These ideas refer to the tendency to make sweeping generalizations about people, things, or situations based on limited or incomplete information. This leads to misunderstandings, stereotypes, and false assumptions, which can have negative consequences for students and society as a whole. One of the main reasons behind this pattern of ideas is the cognitive shortcut that saves time and effort. Instead of carefully considering all available information, students rely on their prior experiences and assumptions to make quick judgments. Another reason why college students tend to overgeneralize is that they may lack the critical thinking skills needed to evaluate information.

Mind reading:

The capacity to discern others' emotional or mental states from subtle physical or facial cues is a crucial aspect of social cognition, essential for appropriate social functioning. This ability is frequently evaluated using the Eye-Reading task, which involves images of eyes representing various mental states. Factors such as the cultural context of the interaction influence mind-reading, emotion recognition, and other social cognitive skills (Meulen et al., 2017). This ability consists of a set of inferences because, firstly, these mental states cannot be directly observed, and secondly, they are used (mind reading) to specifically predict the behavior and actions of others (Sheykhzadeh and Gholam, 2014). Grasping the mental state of others through mind reading involves not only analyzing their intentions, plans, personalities, knowledge, emotions, beliefs, and desires but also understanding the social context and circumstances in which these situations or events take place (Molina and Rosa, 2019).

Humans employ two distinct cognitive strategies to comprehend and anticipate the actions of others. The first strategy, known as mind reading, involves attributing various behaviors to internal states like intentions or emotions. The second strategy, behavior reading, involves interpreting an individual's actions based on stimulus response patterns, without assuming any underlying internal states (Terada and Seiji, 2017).

Researchers suggest that mind reading is a sophisticated cognitive ability enabling individuals to deduce others' mental states. This encompasses various processes like perspective-taking and empathy. Perspective taking is the skill of viewing situations from another person's standpoint. Empathy is the capacity to comprehend and share others' emotions. These cognitive abilities are crucial for effective mind reading and significantly impact interpersonal interactions, particularly among students.

Emotional Reasoning:

Emotions are a tool for instilling beliefs, creating a reality that leads us to act on an often-imperfect amount of information. Emotions provide us with a picture of reality that seems more likely than that supported by data and logic (Macagno, 2014).

Emotional reasoning is the conviction that something is true simply because you strongly feel it to be so, often disregarding or minimizing evidence to the contrary. For instance, you might think, "I know I perform well at work, yet I still feel like a failure" (Beck, 2005), indicating that your emotions shape your perception of reality.

Another example is, "I feel depressed; therefore, my marriage must be failing" (Leahy, 2017), and emotional reasoning is the process by which subjective feelings, rather than objective evidence, are used to inform the conclusions one reaches about the outside world. This process has also been described as "exceptional reasoning," in that it involves "reasoning from the outcome" such that the proposition "If there is danger, I feel anxious" is assumed to mean "If I feel anxious, there must be danger." Kahnemann et al. have argued that heuristics allow for simplified and rapid processing of information, and also allow processing to be minimally cognitively demanding. Heuristics are therefore valuable in situations where an individual's emotions or intuition can help make quick and effective decisions, for example, when deciding not to walk down a dark alley at night and the emotional thoughts that come to mind are: "I don't feel right." However, emotional reasoning, like other heuristics, can also provide misleading results. When emotional reasoning repeatedly leads to incorrect interpretations, it can contribute to pathological emotional states (Berle and Michelle, 2013).

Researchers contend that emotions are a core component of the human experience, influencing our perceptions and interactions with the surrounding world. One-way emotions influence our behavior is through a phenomenon known as emotional reasoning. Emotional reasoning is a cognitive bias whereby individuals rely heavily on their emotions when making judgments or decisions, without critically evaluating the evidence or reasoning behind them. At the heart of emotional reasoning is the belief that our emotions are an accurate reflection of reality. When we experience strong emotions, such as fear, anger, or joy, we can feel overwhelmed, leading us to believe that our emotions are a reliable guide to interpreting situations or making choices (we buy into our emotions). For instance, feeling anxious about an upcoming job interview might lead us to believe that we are not qualified, despite having the necessary qualifications and skills. Similarly, experiencing a strong attraction to someone might make us assume we like them, even if we don't know them well or share similar values.

RESULTS

Detecting twisted thinking among university students: This goal was achieved by applying the twisted thinking test to the research sample of 400 male and female students. After statistical analysis using one-sample t-test, the results indicated that the arithmetic mean of the sample in the test was 64.45 with a standard deviation of 3.45. When compared to the hypothetical mean of the test of 60, it became clear that the arithmetic mean was higher, and the calculated t value was 9.54, exceeding the tabular t value of 1.96 at a significance level of 5%, with 399 degrees of freedom, as shown in Table and Figure 1.

Table 1. Shows the arithmetic and hypothetical averages, standard deviation, calculated and tabular T-value of the research sample.

No	Arithmetic mean	Standard deviation	Hypothetical mean	T-value		Significance level
				Calculated	Tabular	
400	64.45	3.45	60	9.54	1.96	function

Figure 1. The location of the scores of the sample members on the standard distribution curve.

The researchers attribute this result to high academic expectations and a competitive environment, which are stressful factors for students, causing feelings of incompetence and fear of failure through catastrophic thoughts, negative Filtering Thoughts, and other patterns of distorting reality for twisted thinking. Social interactions and personal challenges also have a role of negative selective filtering of worst-case scenarios and jumping to unrealistic conclusions that are not based on evidence, which further distorts reality, amplifies negatives, and reduces positives, which affects students' thinking.

CONCLUSION

According to the outcomes, the researchers concluded that:

Young male and female university students have a twisted way of thinking, as a result of social upbringing that prepares young people for intellectual stereotypes similar to their parents.

Author contributions

Mohamed Hashim: Responsible for data processing, conducting formal analysis, securing funding, developing software, and writing the original draft.

Yasir Mahfoodh: Conceptualization, Supervision, Visualization, Mohammed Hashim and Yasir Mahfoodh: Writing – review and editing, Methodology, Project administration

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