

**Exploratory structural equation modeling analysis of the apathy
assessment Scale among TikTok users**

**Mahmoud Ali Moussa & Heba Said Abo El Naga & Shereen
Abdel-Gawad Ahmed**

Exploratory structural equation modeling analysis of the apathy assessment Scale among TikTok users

Mahmoud Ali Moussa

Suez Canal University, Faculty of Education, Department of Psychology, Ismailia,
Egypt

<https://orcid.org/0000-0002-5611-1792>

Mahmoud_muhanna@edu.suez.edu.eg

Heba Said Abo El Naga

Suez Canal University, Faculty of Education, Ismailia, Egypt

<https://orcid.org/0009-0006-2799-1889>

heba_saied@edu.suez.edu.eg

Shereen Abdel-Gawad Ahmed

Education and Social Studies Department, College of Arts and Sciences Nizwa
University, Oman

shereen.ismail@unizwa.edu.om

and Educational Psychology Department, Faculty of Education, Suez Canal
University

Pgs.04563@edu.suez.edu.eg

Received on 6th March 2025

Accepted on 1st July 2025

Abstract: This study aimed to investigate the factor structure of the Apathy Assessment Scale among a sample of university students who actively use TikTok. The research was motivated by the growing societal concerns in Egypt, where social media content creators frequently engage in behaviors that violate ethical standards, often prioritizing rapid financial gain over meaningful contributions. This study adopts a psychological lens to examine apathy, diverging from previous research that predominantly emphasized neurological and medical perspectives. A cross-sectional design was employed, utilizing the translated version of Martin's form of the 18-item Apathy Scale. 197 participants of both genders were selected by voluntary random sampling method.

<http://dx.doi.org/10.29009/ijres.8.4.2>

Informed consent was obtained from all participants following the ethical guidelines, clearly communicating their rights and obligations. Importantly, no incentives were provided for participation in the study. Data analysis was conducted using Jamovi 2.5.6 software, chosen for its suitability in handling ordinal data. The initial analysis relied on confirmatory factor analysis to assess the theoretical three-subscale structure of apathy. However, the results indicated that the proposed structure did not adequately fit the data from the sample drawn from Suez Canal University. To address this issue, exploratory structural equation modeling was employed, allowing the scale items to load freely onto factors, thereby offering a more accurate reflection of the psychological dimensions of apathy within this population. The study identified a unique, valid, and reliable factor structure applicable to university students who use the TikTok platform. Based on these findings, the study recommends the implementation of university seminars aimed at reducing apathy and the distortion of self-concept, which can result from engagement with superficial and non-substantive content. Such content may place its creators at risk of legal repercussions due to violations of societal and ethical norms.

Keywords: TikTok; Exploratory Structural Equation Modeling; Apathy; Adolescents.

1. Introduction:

TikTok has emerged as a dominant platform for entertainment and self-promotion, offering users opportunities to achieve fame that might remain out of reach on other social media platforms. Its content spans a wide spectrum, including humor, lighthearted fun, religion, and more. A significant portion of TikTok's appeal lies in its creative use of multimedia, where users remix movie clips with their voices to produce captivating and personalized content.

However, the platform's influence is not without controversy. In the race to go viral, some users propagate trends that are superficial, unethical, or even illegal, resulting in potentially harmful consequences. The relentless pursuit of fame often motivates individuals to prioritize sensationalism over substance, sometimes crossing ethical boundaries instead of harnessing their influence to promote positive change.

Excessive engagement with social media platforms like TikTok can contribute to profound psychological effects, including loneliness, depression, and a gradual descent into apathy. This phenomenon is exacerbated as users imitate attention-grabbing content from others, often losing their individuality in the process. While some TikTok videos, particularly those with educational or religious themes, foster positive behavior, many others violate privacy and intellectual property rights by reusing copyrighted materials without authorization.

An emerging concern involves users capitalizing on seasonal events or global crises, such as climate change, to attract followers. This opportunistic behavior can desensitize audiences, fostering apathy or, in severe cases, encouraging cyberbullying. Harmful content aimed at gaining likes and comments often distorts users' authentic selves, leading to long-term psychological damage, including diminished self-esteem and identity confusion.

Such damage frequently manifests in feelings of guilt, shame, and inadequacy, particularly when users' actions conflict with societal norms or expectations. The need for validation through likes and followers drives some individuals to adopt unethical

practices. Notably, apathy is identified as a potential precursor to depressive symptoms, though depression itself is frequently overlooked as a driver of addictive digital behaviors. The study argues that this cycle is rooted in the stigma and frustration stemming from unmet goals and social rejection.

The relentless pursuit of online validation can also disrupt personal relationships and lead to legal complications. Individuals consumed by content creation often detach from social connections, becoming socially isolated and financially dependent on ephemeral digital income streams. This fixation on monetizing likes and views often supplants more constructive and meaningful pursuits.

This study investigates a sample of university students struggling with diminished motivation for academics and personal growth. These students often display self-centered tendencies, prioritizing their needs over those of family and friends. Furthermore, the research highlights the harm inflicted on peers through platforms like TikTok and Facebook, such as non-consensual image sharing, exploitation by harmful trends, public shaming, and even suicidal ideation resulting from failed attempts to resist blackmail.

The primary objective of this study is to pinpoint indicators of apathetic behavior, which may serve as early warning signs of depressive tendencies. The findings aim to inform interventions that provide targeted guidance and support for affected students. Additionally, the study emphasizes the importance of developing educational programs to raise awareness among young people about the dangers of harmful TikTok behaviors. These initiatives aim to prevent social apathy, curtail addiction to trending content, and mitigate its negative impact on individuals' personal and professional lives.

2. Literature review:

2.1. Concept of Apathy:

Apathy is a prevalent behavioral syndrome observed in Alzheimer's disease and various neurological and psychiatric disorders. Despite its widespread occurrence, the

<http://dx.doi.org/10.29009/ijres.8.4.2>



concept of apathy remains poorly defined. Recent research, however, provides clarity, describing apathy as a persistent disorder of motivation sustained over time (Robert et al., 2009). Studies by Iacobacci (2017) and Apocarp et al. (2021) corroborate this definition, linking apathy to numerous neurological disorders, including frontotemporal dementia (FTD), Parkinson's disease (PD), Alzheimer's disease (AD), brain injuries, strokes, and cognitive impairments. Notably, apathy can also manifest as an early symptom, often preceding cognitive decline.

While historically regarded as a unidimensional symptom of broader neuropsychiatric disorders, contemporary perspectives conceptualize apathy as a multidimensional clinical syndrome encompassing emotional, cognitive, and behavioral disturbances (Pimentel et al., 2020). Behaviorally, apathy is defined as a lack of motivation not attributable to diminished consciousness, cognitive impairment, or emotional distress (Marin et al., 1991). It is marked by reduced goal-directed behavior and cognition (Stark Stein & Lenten, 2008), diminished initiative, and disinterest in daily activities (Iacobacci, 2017). Furthermore, apathy encompasses deficits across cognitive, emotional, and behavioral domains, as evidenced by definitions from Reimo et al. (2014) and Marek et al. (2021), who emphasize the voluntary and purposeful reduction of behavioral responses originating from the self.

In neurological contexts, apathy often occurs alongside conditions like Parkinson's disease but is recognized as an independent behavioral disorder (Santangelo et al., 2014). It can manifest as neglect toward social norms, laws, and contextual events (Mousavi & Milani, 2022) or as a syndrome arising from psychological, neurological, or medical disorders (Massimo et al., 2018). Psychologically, apathy represents a state where motivation declines without altered awareness, cognitive impairment, or emotional distress (Lázaro-Perlado, 2019).

Scientifically, apathy is characterized by simultaneous deficits in behavioral, cognitive, and emotional components essential for goal-directed behavior (Marin et al., 1991). It manifests as reduced activity across cognitive, emotional, behavioral, or social domains, particularly in individuals at risk of neurological impairments like stroke (Tay

et al., 2021). It is frequently associated with functional impairments resulting from neuropsychiatric disorders (Clarke et al., 2011). Even among healthy individuals, apathy can emerge as a motivational deficit, particularly in response to adverse environmental or social conditions (Ang et al., 2017).

Researchers often describe apathy as a state characterized by diminished energy and motivation to engage in or care about daily situations and events. In some instances, it may function as a defense mechanism, shielding individuals from pain or trauma. Social apathy, in particular, involves an excessive focus on personal preferences and self-interests, undermining the positivity of social relationships and participation in collective activities (Ghasizadeh & Kianpour, 2015). This form of apathy reflects a conscious disregard for social responsibilities and altruism in favor of individual gain (Mousavi & Milasi, 2022).

This study adopts the social apathy framework to explore how selfish behaviors manifest among content creators on platforms like TikTok. Many prioritize personal gain at the expense of others, as evidenced by harmful or unethical content that has sometimes resulted in legal consequences for its creators. This conceptualization emphasizes apathy's role in eroding social cohesion and accountability in digital spaces.

2.2. Diagnostic Criteria for Apathy:

Several studies have proposed criteria for diagnosing apathy (Starkstein & Leentjens, 2008; Robert et al., 2009; Robert et al., 2018; Tay et al., 2021; Miller et al., 2021), as outlined below:

- A. Loss or reduction of motivation in behavioral, cognitive, emotional, or social dimensions compared to the individual's previous level of functioning, which does not align with age or cultural norms. These changes in motivation can be reported by the patient or observed by others.
- B. Presence of at least one symptom in two of the following three areas for no less than four weeks during most of the time:

- ❖ Behavior and Cognition: Loss or reduction of goal-directed behavior or cognitive activity, as evidenced by at least one of the following: Lack of effort or energy to perform daily activities, Dependence on others to organize daily activities, Decreased interest or taking longer to make decisions when given different options, Less interest in news or less reactive to it, whether positive or negative or less interested in trying new things, reduced concern for their health, well-being, or personal appearance.
 - ❖ Emotional Expression/Response: Loss or reduction of emotional responsiveness, as evidenced by at least one of the following: showing less spontaneous emotion concerning their affairs or less interest in events that should matter to them or people they know well, expressing fewer emotions in response to positive and negative events, being less concerned about the impact of their actions on others, showing less empathy towards the feelings of others, demonstrating fewer verbal or physical reactions that reveal their emotional state.
 - ❖ Social Interaction: Loss or reduction of engagement in social interaction, as evidenced by at least one of the following: Less interest in activities and plans made by others, less interest in friends and family, reduced participation in activities, even when encouraged, less persistence in maintaining or completing tasks or activities, withdrawing from conversations and discussions with others, preferring to stay at home more frequently or longer than usual and showing less interest in going out to meet people.
- C. These symptoms (A-B) cause significant clinical impairment in personal, social, occupational, or other key areas of functioning.
- D. The symptoms (A-B) are not exclusively explained by physical disabilities (e.g., blindness, hearing loss), motor impairments, decreased consciousness,

<http://dx.doi.org/10.29009/ijres.8.4.2>

the direct physiological effects of a substance, or major changes in the patient's condition.

2.3. Similarities and dissimilarities Between Depression and Apathy in Neurocognitive Disorders:

Depression and apathy are common neuropsychiatric disorders, often presenting in various syndromes and sharing some similar symptoms. However, distinguishing between apathy and depression can be challenging since both conditions can occur simultaneously and have overlapping characteristics. Apathy is associated with negative outcomes, especially in cases with neurodegenerative causes (e.g., Alzheimer's disease) (Lanctôt et al., 2023).

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-V), depression is a mental condition characterized by a changed mood, marked by sadness, hopelessness, reduced interest in daily activities, a personal sense of discomfort, feelings of worthlessness, and low self-esteem. Apathy can be an aspect of depression in that it involves a lack of motivation and diminished interest in most or all daily activities. However, apathy can also be a distinct, treatable condition. People with apathy tend to be passive, unconcerned about their health and do not complain, often displaying a flat affect with no emotional response to situations that typically evoke emotions. In contrast, people with depression feel discomfort, actively avoid social situations, and experience sadness, hopelessness, guilt, low self-esteem, pessimism, and even suicidal thoughts (Iacobacci, 2017).

Figure 1 illustrates that while apathy and depression are co-occurring syndromes, they can be differentiated: (a) distinct and overlapping symptoms of apathy and depression, where a reduction in goal-directed behaviors characterizes apathy, while negative emotions mark depression. Shared symptoms include loss of pleasure and energy; (b) prevalence rates of apathy and depression after a stroke (Tay et al., 2021).

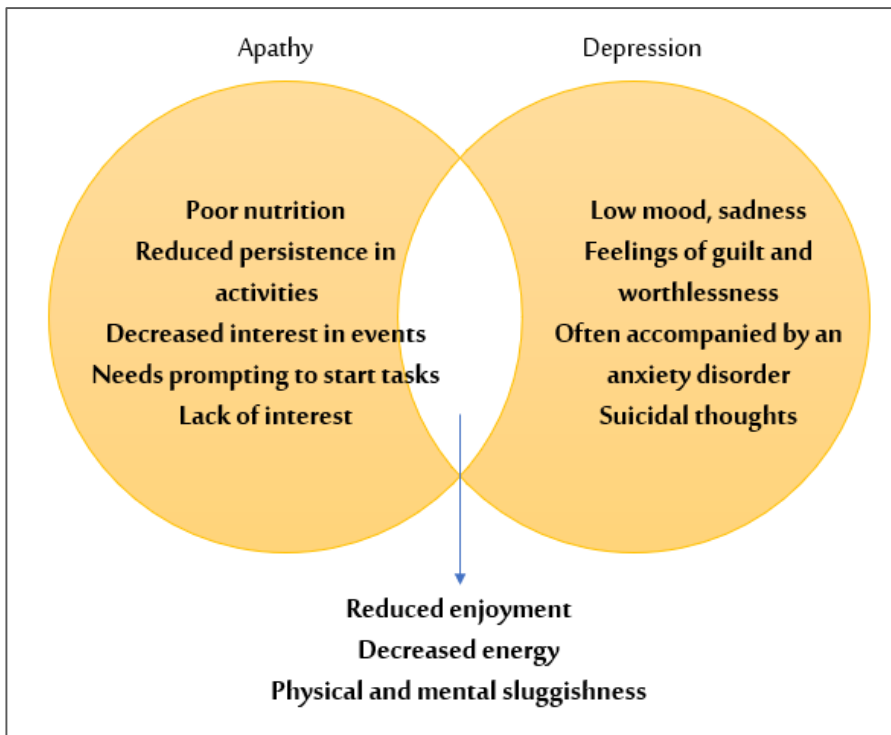


Figure 1. Symptoms of Both Depression and Apathy.

By reviewing previous studies, such as those by Iacobacci (2017), Pimontel et al. (2020), Leung et al. (2021), Mohamed Nour et al. (2021), Toloraia et al. (2022), Ubukata et al. (2022), Connors et al. (2023), and the American Psychiatric Association (2013), researchers have identified the similarities and dissimilarities features between apathy and depression. The similar features of apathy and depression are the following:

1. Loss of interest: Both individuals with apathy and those with depression experience a loss of interest in activities and things that were previously enjoyable.
2. Decreased energy: Both groups suffer from reduced energy levels and lack of motivation to engage in activities.

- 3. Attention deficit: Both conditions are associated with challenges in focusing and maintaining attention.
- 4. Sleep changes: Both may experience disruptions in sleep patterns, such as insomnia or excessive sleep.
- 5. Appetite changes: Both conditions can lead to changes in appetite, either an increase or a decrease.

dissimilarities feature between apathy and depression symptoms as represented in Table 1.

Table 1. shows dissimilarities features between apathy and depression.

Characteristic	Apathy	Depression
General mood	Absence of feelings, whether positive or negative	Deep sadness and a sense of hopelessness
Social relationships	Withdrawal from social relationships	The desire for isolation and distance from others
Causes	Maybe a result of defense mechanisms, traumatic events, or a symptom of another condition	Often caused by a chemical imbalance in the brain or psychological and social factors
Density	Can be mild or temporary	Typically, more severe, and long-lasting

However, many questions remain regarding apathy, including its phenomena, clinical description, and neuropsychological and neurobiological foundations. Is apathy a neuropsychological symptom or a behavioral response? Is apathy the same construct in depression as it is in Alzheimer’s disease? How can it be assessed? How can an individual understand apathy from a clinical neuroscience perspective (Steffens et al., 2022)?

From previous studies, it can be inferred that apathy is a complex psychological state characterized by a lack of interest, satisfaction, or emotional response towards events and people. It may appear as a symptom associated with neurological and psychiatric disorders such as depression, schizophrenia, and Alzheimer’s disease, or it

may be a condition. Despite its increasing prevalence in psychiatric disorders, apathy remains poorly understood due to the lack of a consensus definition and clear diagnostic criteria in the Diagnostic and Statistical Manual of Psychiatric Disorders (APA). This hinders researchers and clinicians from understanding the causes and effects of apathy and providing appropriate treatment for affected patients. The complexity and difficulty in measuring apathy, coupled with its varied manifestations among individuals, contribute to the challenge. The absence of a clear definition complicates its diagnosis and treatment and limits researchers' ability to conduct comparative studies and generalize results. Further research is essential to identify the factors influencing apathy and to develop new tools and methods for measuring it. Establishing clear diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders will improve our understanding of apathy and enhance patient care.

2.4. Apathy assessment phenomenon:

The Marin et al. (1991) scale consists of 18 items and was evaluated in three settings: medical, laboratory, and assessment. It was tested on 123 individuals aged between 53 and 85 years, meeting research criteria for stroke in either hemisphere, potential Alzheimer's disease, severe depression, or elderly control. The scale covers three areas: reduced productivity, diminished goals, and decreased emotional responses to success or failure. Internal consistency was calculated to range between 0.86 and 0.90. This study adopts this type of assessment to evaluate apathy among TikTok users, as apathy is considered a precursor to anxiety and severe depression, leading to reduced productivity, the creation of content with little value, diminished goals for the resulting content, and decreased control over matters.

The Hsieh et al. (2012) scale consists of 18 items and was applied to 144 Alzheimer's patients. The Taiwanese version of the apathy assessment scale was validated, with a Cronbach's alpha coefficient of 0.85. The scale was retested over 3 days, yielding a Cronbach's alpha of 0.89. Factor analysis revealed three subscales of apathy: general, social, and insight apathy.

The Santangelo et al. (2014) scale consists of 17 items and was applied to a sample of 60 patients who were not diagnosed with psychosis or depression. Twenty patients were classified as apathetic according to diagnostic criteria. The Cronbach's alpha coefficient was 0.872. Factor analysis using principal components revealed three factors: the first factor (34.4% of the total variance explained) represents the components of the apathy concept; the second factor (8.5% of the variance) represents a social dimension; and the third factor (7.9% of the variance) represents an insight dimension. The cutoff score is 33/34 for normal cases, but a cutoff score of 38/39 is necessary for clinical cases.

The Radakovic & Abrahams (2014) scale involved 311 healthy participants. Principal component analysis and exploratory factor analysis revealed four subscales (executive, emotional, cognitive, and behavioral), which accounted for 28.9% of the total variance.

The Raimo et al. (2014) scale was applied to 70 patients with multiple sclerosis. The Cronbach's alpha coefficient was 0.87. Factor analysis identified three factors: cognitive dimension ($\alpha = 0.87$), general apathy ($\alpha = 0.84$), and behavioral and emotional aspects ($\alpha = 0.74$). These factors were significantly correlated with the total AES score (all $\rho \geq 0.73$, $p < 0.001$). The total AES score showed good convergent validity ($\rho = 0.38$) and discriminative validity when compared with the Expanded Disability Status Scale ($\rho = 0.38$), the Mini-Mental State Examination ($\rho = -0.17$), and the Hamilton Depression Rating Scale ($\rho = 0.37$).

2.5. The present study:

TikTok has become an integral part of daily life, particularly among younger individuals, who frequently use the platform as a means to escape negative emotions and avoid confronting real-life challenges. While TikTok offers moments of entertainment and distraction, its content, typically short, fast-paced, and often superficial or negative, has been linked to diminished attention spans and a sense of boredom. Over time, this can foster indifference and apathy. The platform's reliance on

instant gratification contributes to an unrealistic expectation of perpetual satisfaction, making real-life experiences appear less rewarding by comparison.

Another significant factor influencing apathy among TikTok users is the culture of comparison it promotes. Users are often exposed to idealized portrayals of life, which can evoke feelings of inadequacy and dissatisfaction with their own lives. This phenomenon is not unique to TikTok but has been widely documented across social media platforms. Studies such as Kross et al. (2013) found that time spent on Facebook correlates with increased feelings of loneliness, partly due to negative social comparisons. Similarly, Twenge and Campbell (2019) revealed that adolescents who devote significant and increasing amounts of time to digital media, including social media platforms like TikTok, are at greater risk of depression and suicidal ideation. These mental health challenges are frequently accompanied by loneliness, which can further contribute to the development of apathy.

The content on TikTok also amplifies the issue by focusing on themes that promote instant reward cycles or, at times, propagate negative or even violent material. This dynamic reduces users' capacity for sustained focus and meaningful engagement, reinforcing patterns of apathy and detachment. As such, TikTok has the potential to significantly shape user behavior, particularly in younger demographics, who may become more disengaged from real-world activities and relationships as a result of prolonged exposure to the platform.

The current study seeks to examine the levels of apathy exhibited by university students, with a focus on potential differences between male and female TikTok users. By identifying patterns of apathy in their behaviors, the study aims to contribute to the growing body of research on the psychological and social impacts of social media usage, particularly on platforms driven by short-form video content. This investigation will provide valuable insights into the complex interplay between digital media consumption, mental health, and motivational states, offering a basis for interventions to mitigate apathy in this population.

3. Method:

3.1. Participants: The total sample for the study consisted of 205 students, selected using a snowball sampling method. After obtaining informed consent for the scale, 8 students chose not to participate and were thus excluded from the analysis. The study was conducted voluntarily. The final sample for analysis included 197 students from Suez Canal University. The sample was divided by gender into 177 females (89.8%) and 20 males (10.2%). The ages of the participants ranged from 18 to 37 years, with a mean age of 19.9 years and a standard deviation of 1.90.

3.2. Apathy Assessment Scale: This scale aims to classify individuals' thoughts, actions, and emotions over the past four weeks (Resnick et al., 1998). It is an 18-item scale for assessing apathy, with responses originally rated on a four-point scale, which the study has now adapted to a five-point scale (Always, Often, Sometimes, Rarely, Never). On this scale, a response of "Always" gave 5 scores, while "Never" gave it one score. Three negative items (6, 10, and 11) need to be reverse-coded. The total score on the scale ranges from 18 to 72, with a lower score indicating higher levels of apathy.

3.3. Procedures and Statistical Analysis:

The study targeted university students, who were recruited through WhatsApp and Telegram groups dedicated to TikTok users. Participation was entirely voluntary, and an ethical consent form was provided via Google Forms. This form outlined the rights and responsibilities of respondents, ensuring informed consent was obtained from all participants prior to their involvement in the research. The study's sample consisted of young individuals of both genders.

Data analysis and hypothesis testing were performed using Jamovi 2.5.6, a free and open-source statistical software. To explore the underlying structure of the scale items, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were employed. Descriptive statistics were also utilized to assess and examine indicators of apathy among young TikTok users. These methods provided a

comprehensive understanding of the patterns and prevalence of apathy within the sample population.

4. Results:

4.1. Factor Structure of the Apathy Scale Among a Sample of Young TikTok Users:

Confirmatory factor analysis was conducted using the default DWLS method to assess the factor structure of the apathy scale among young TikTok users. This approach robustly addressed measurement errors. The model fit indices are summarized in Table 2.

Table 2. Model Fit Indices for the Apathy Scale Structure among a Sample of Young TikTok Users.

X2(df)	RMSEA	SRMR	CFI	TLI	NNFI	GFI
800 (132)**	.157	.110	.773	.737	.737	.936

Table 2 indicated a poor fit for the chi-square index and RMSEA, CFI, TLI, and NNFI indices, suggesting that the model did not adequately represent the sample data. This means the sample data were not well-defined. Additionally, the program indicated that the covariance matrix for the latent variables was not positive definite. This issue may be attributed to the nature of the items or the sample conditions, which may have led to reverse responses. This was evident in the student's performance on certain items and may suggest social desirability or a belief that higher scores indicate greater apathy. Negative performance was observed on items 2, 3, 5, 6, 10, 16, and 17, which explains the need for reverse coding of items 6 and 10. The program identified these three items as having negative performance and addressed this in the analysis process. Item loadings are presented in Table 3.

Table 3. Loadings of Apathy Scale Items on the Three Latent Factors.

Factor	Items	Loadings	SE	Z	P-Value
Factor 1 AVE= .369	1	.20	.069	2.91	.004
	2	.26	.059	4.46	.000
	3	.73	.032	23.21	.000
	5	.41	.051	8.05	.000
	6	.67	.034	19.94	.000
	8	.32	.056	5.80	.000
	9	.64	.036	17.68	.000
	10	.80	.024	33.17	.000
	11	.74	.032	23.14	.000
	16	.68	.044	15.62	.000
Factor 2 AVE= .315	12	.82	.033	24.49	.000
	13	.97	.028	34.31	.000
	14	.24	.073	3.23	.001
Factor 3 AVE= .556	4	.63	.042	15.11	.000
	7	.65	.040	16.08	.000
	15	.26	.060	4.40	.000
	18	.62	.043	14.31	.000

The loadings were generally acceptable, but items 1, 2, 14, and 15 had low values, indicating weak performance on these items. The Average Variance Extracted (AVE) index, which measures the validity of structural equation modeling or confirmatory factor validity, assesses the average variance explained amounts by the latent construct in the observed indicators or measured variables. AVE is an indicator of convergent validity for a construct, with values of 0.50 or higher suggesting adequate convergent validity, meaning the latent construct explains at least 50% of the variance in its measured indicators on average. Thus, the first and second factors lack convergent validity. Additionally, the confirmatory factor model exhibited poor fit and did not align well with the sample data.

4.2. Exploratory Structural Equation Modeling:

Exploratory Structural Equation Modeling (ESEM) is a hybrid approach that combines the strengths of exploratory and confirmatory factor analysis within a structural equation modeling framework. ESEM allows for cross-loadings between indicators and factors, in contrast to the strict one-dimensional loadings in confirmatory factor analysis. It provides greater flexibility in examining the factor structure through a set of indicators and often results in a better model fit compared to confirmatory factor analysis. ESEM typically employs factor rotation to reflect the interconnected nature of psychological constructs under the main construct, allowing for cross-loadings between indicators and factors.

The study utilized ESEM to improve model fit considering the sample data and allow items to load freely on any of the latent factors, reflecting the true psychological and emotional structure of TikTok users. The oblique rotation method GEOMIN was used, which assumes that the factors are correlated, fitting psychological constructs. GEOMIN rotation minimizes the sum of squared off-diagonal elements in the factor correlation matrix. Table 4 presents the model fit indices for the ESEM model of the apathy assessment scale.

Table 4. Model Fit Indices for the ESEM Model of the Apathy Assessment Scale.

X2(df)	RMSEA	SRMR	CFI	TLI	NNFI	GFI
267 (102)**	.036	.055	.944	.916	.916	.990

The model fit indices were acceptable in light of the sample data, although the chi-square index showed poor fit. The loadings on the three latent factors are presented in Table 5.

Table 5. Loadings of Items for the ESEM Model of the Apathy Assessment Scale.

Factor	Items	Factor 1	Factor 2	Factor 3
Factor 1	1	-.59	.04	.14
	2	.72	.05	-.26
	3	.62	.13	.33
	5	.41	-.20	.37
	6	.33	.21	.42
	8	-.64	.07	.01
	9	.01	-.22	-.59
	10	.20	.30	.58
	11	-.02	-.07	-.79
	16	-.02	.76	.08
	17	-.04	.99	.02
Factor 2	12	-.02	.15	.77
	13	.10	.24	.78
	14	-.24	.32	.36
Factor 3	4	.66	.03	.32
	7	.34	.18	.45
	15	-.12	.21	.24
	18	.08	.76	.03

Notes. The bold values of loadings refer to significant loadings.

The factor loadings for the variables were significant across the dimensions (bold loadings in the table). The resulting model is shown in Figure 2.

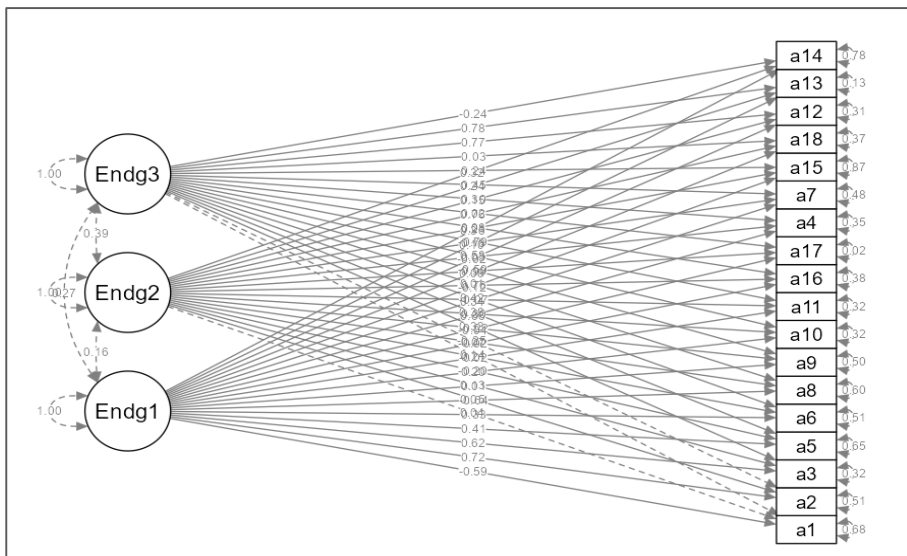


Figure 2. Exploratory Structural Equation Modeling (ESEM) Model of the Apathy Assessment Scale for a Sample of Young TikTok Users.

The analysis revealed notable fluctuations in the item loadings proposed by the theoretical framework. Specifically, it was observed that negative participant responses to certain items dissipated, with Item 6 demonstrating positive loadings across all dimensions. Item 6 also exhibited the highest loading on the third factor while maintaining a secondary, albeit weaker, loading on its original dimension. The second factor displayed greater consistency, encompassing two items from the third dimension (Items 7 and 15) and three items from the first dimension (Items 6, 9, and 10). Additionally, a new dimension emerged, integrating items from the first dimension (Items 16 and 17) with an item from the third dimension (Item 18). These findings suggest that apathy may represent a distinct psychological construct, separate from those previously explored in psychological and neurological research.

The study utilized a modified version of the Marin et al. (1991) apathy scale, which was based on items adapted from Resnick et al. (1998). This scale comprises three subscales: reduced productivity, diminished goals, and emotional unresponsiveness. Among these, the emotional unresponsiveness factor exhibited the

highest consistency, while the diminished goals factor fragmented and coalesced into a newly identified factor labeled *perseverance*. This factor encompasses traits such as initiative, motivation, and commitment to daily productivity—attributes often observable among TikTok users who engage with content during the day (Connors et al., 2023; Iacobacci, 2017; Leung et al., 2021; Pimontel et al., 2020; Toloraia et al., 2022; Ubukata et al., 2022).

The discrepancy between the measured phenomenon and the proposed construct may stem from participants experiencing depressive states driven by a desire to consume or create content. In both scenarios, shared factors include viewing a wide array of videos and following specific trends aligned with their current mood. Consequently, emotional responses to content are often superficial, as users seek material that modulates their neurologically stimulated emotional states. Unlike traditional social media platforms such as Facebook or Twitter, TikTok appears to elicit a neurologically neutral state rather than a dysfunction. This neutrality indicates that the apathy associated with TikTok use arises not from cognitive impairment but from attempts to regulate emotional states.

TikTok users often engage with content passively, reviewing and reluctantly continuing to watch videos before selecting material that aligns with or alters their mood. This behavioral pattern drives users to follow creators who cater to their emotional needs, as supported by Miller et al. (2021) and Tay et al. (2021). Some individuals share personal or socially sensitive content to gain fame and followers for financial profit. This behavior, marked by selfishness and Machiavellian tendencies, contributes to a pattern of social apathy. In extreme cases, individuals share harmful or defamatory content to attract attention and engagement, as observed by Ghasizadeh & Kianpour (2015) and Mousavi & Milasi (2022).

Real-world examples reveal that female TikTok content creators are particularly vulnerable to cyber and economic crimes, including defamation, attempted murder, incitement to prostitution, and human trafficking—crimes often associated with the dark web. This pattern of apathy fosters victimization and leads to a distorted ego,

negatively impacting social interactions. Users unconsciously develop behaviors aimed at gaining approval but are deemed inappropriate and rejected by societal norms. TikTok's algorithmic reinforcement of such behaviors encourages violations of social norms and laws.

To address these issues, the study recommends organizing educational seminars for university students to raise awareness about TikTok's detrimental effects on moral intelligence, irrational idea formation, and ego distortion. Additionally, it calls for the Egyptian legislature to enact laws criminalizing internet misuse and to empower cybercrime units to combat offenses linked to TikTok usage effectively.

Availability of data and materials:

The datasets produced and analyzed in the present study are not publicly accessible to protect the privacy of the participants. However, interested parties may obtain access to the datasets by contacting the corresponding author and making a reasonable request.

Competing interests: The authors declare no competing interests.

Funding: The authors did not receive support from any organization for the submitted work.

Reference

- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Ang, Y. S., Lockwood, P., Apps, M. A., Muhammed, K., & Husain, M. (2017). Distinct subtypes of apathy are revealed by the apathy motivation index. *PloS one*, 12(1), e0169938
<https://doi.org/10.1371/journal.pone.0169938>.
- Azocar, I., Livingston, G., & Huntley, J. (2021). The association between impaired awareness and depression, anxiety, and apathy in mild to moderate Alzheimer's disease: a systematic review. *Frontiers in Psychiatry*, 12, 633081, <https://doi.org/10.3389/fpsyt.2021.633081>.
- Clarke, D. E., Ko, J. Y., Kuhl, E. A., van Reekum, R., Salvador, R., & Marin, R. S. (2011). Are the available apathy measures reliable and valid? A review of the psychometric evidence. *Journal of psychosomatic research*, 70(1), 73-97.
<https://doi.org/10.1016/j.jpsychores.2010.01.012>
- Connors, M. H., Teixeira-Pinto, A., Ames, D., Woodward, M., & Brodaty, H. (2023). Distinguishing apathy and depression in dementia: A longitudinal study. *Australian & New Zealand Journal of Psychiatry*, 57(6), 884-894, <https://doi.org/10.1177/00048674221114597>.
- Ghasizadeh, H., & Kianpour, M. (2015). A study of social apathy among students (The case of the University of Isfahan). *Strategic Research on Social Problems*, 4(1), 59-78.
- Glenn, M. B., Burke, D. T., O'Neil-Pirozzi, T., Goldstein, R., Jacob, L., & Kettell, J. (2002). Cutoff score on the apathy evaluation scale in subjects with

traumatic brain injury. *Brain Injury*, 16(6), 509-516.

<https://doi.org/10.1080/02699050110119132>

Hsieh, C. J., Chu, H., Cheng, J. J. S., Shen, W. W., & Lin, C. C. (2012). Validation of apathy evaluation scale and assessment of severity of apathy in Alzheimer's disease. *Psychiatry and clinical neurosciences*, 66(3), 227-234, <https://doi.org/10.1111/j.1440-1819.2011.02315.x>.

Iacobacci, C. (2017). Common and different features between depression and apathy in neurocognitive disorders. *Clinical and Experimental Psychology*, 3(3), 163-164, DOI: 10.4172/2471-2701.1000163.

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., ... & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS one*, 8(8), e69841, <https://doi.org/10.1371/journal.pone.0069841>.

Lanctôt, K. L., Ismail, Z., Bawa, K. K., Cummings, J. L., Husain, M., Mortby, M. E., & Robert, P. (2023). Distinguishing apathy from depression: A review differentiating the behavioral, neuroanatomic, and treatment-related aspects of apathy from depression in neurocognitive disorders. *International Journal of Geriatric Psychiatry*, 38(2), e5882, <https://doi.org/10.1002/gps.5882>.

Lázaro-Perlado, F. (2019). Apathy: a conceptual review. *Current Psychiatry Research and Reviews Formerly: Current Psychiatry Reviews*, 15(2), 88-104, <https://doi.org/10.2174/1573400515666190306150306>.

Leung, D. K., Chan, W. C., Spector, A., & Wong, G. H. (2021). Prevalence of depression, anxiety, and apathy symptoms across dementia stages: a systematic review and meta-analysis. *International Journal of Geriatric Psychiatry*, 36(9), 1330-1344, <https://doi.org/10.1002/gps.5556>.

<http://dx.doi.org/10.29009/ijres.8.4.2>

M'Barek, L., Mercy, G., Gautier, C., Noquet, M., Legros-Lafarge, E., Fiegl, L., ... & Allain, P. (2021). The use of the French Dimensional Apathy Scale (f-DAS) to assess apathy in schizophrenia: Properties and profiles. *Journal of Affective Disorders*, 294, 181-188.
<https://doi.org/10.1016/j.jad.2021.06.081>

Marin, R. S., Biedrzycki, R. C., & Firinciogullari, S. (1991). Reliability and validity of the Apathy Evaluation Scale. *Psychiatry Research*, 38(2), 143-162.
[https://doi.org/10.1016/0165-1781\(91\)90040-V](https://doi.org/10.1016/0165-1781(91)90040-V)

Massimo, L., Kales, H. C., & Kolanowski, A. (2018). State of the science: apathy as a model for investigating behavioral and psychological symptoms in dementia. *Journal of the American Geriatrics Society*, 66, S4-S12,
<https://doi.org/10.1111/jgs.15343>.

Miller, D. S., Robert, P., Ereshefsky, L., Adler, L., Bateman, D., Cummings, J., ... & Lancôt, K. L. (2021). Diagnostic criteria for apathy in neurocognitive disorders. *Alzheimer's & Dementia*, 17(12), 1892-1904,
<https://doi.org/10.1002/alz.12358>.

Mohamed Nour, A. E. A., Jiao, Y., Teng, G. J., & Alzheimer's Disease Neuroimaging Initiative. (2021). Neuroanatomical associations of depression, anxiety, and apathy neuropsychiatric symptoms in patients with Alzheimer's disease. *Acta Neurologica Belgica*, 121, 1469-1480,
<https://doi.org/10.1007/s13760-020-01349-8>.

Mousavi, S. K., & Milasi, M. A. (2022). Students' Social Apathy in Real and Virtual Worlds: A Comparative Study. *Athens Journal of Mass Media & Communications*, 8(2)m 131- 144.
<https://doi.org/10.30958/ajmmc.8-2-4>

Pimontel, M. A., Kanellopoulos, D., & Gunning, F. M. (2020). Neuroanatomical abnormalities in older depressed adults with apathy: a systematic

<http://dx.doi.org/10.29009/ijres.8.4.2>

review. *Journal of Geriatric Psychiatry and Neurology*, 33(5), 289-303,
<https://doi.org/10.1177/0891988719882100>.

Radakovic, R., & Abrahams, S. (2014). Developing a new apathy measurement scale: Dimensional Apathy Scale. *Psychiatry Research*, 219(3), 658-663,
<https://doi.org/10.1016/j.psychres.2014.06.010>.

Raimo, S., Trojano, L., Spitaleri, D., Petretta, V., Grossi, D., & Santangelo, G. (2014). Apathy in multiple sclerosis: a validation study of the apathy evaluation scale. *Journal of the Neurological Sciences*, 347(1-2), 295-300,
<https://doi.org/10.1016/j.jns.2014.10.027>.

Resnick, B., Zimmerman, S. I., Magaziner, J., & Adelman, A. (1998). Use of the Apathy Evaluation Scale as a measure of motivation in elderly people. *Rehabilitation Nursing Journal*, 23(3), 141-147.
<https://doi.org/10.1002/j.2048-7940.1998.tb01766.x>

Robert, P., Lanctôt, K. L., Agüera-Ortiz, L., Aalten, P., Bremond, F., Defrancesco, M., ... & Manera, V. (2018). Is it time to revise the diagnostic criteria for apathy in brain disorders? The 2018 International Consensus Group. *European Psychiatry*, 54, 71-76,
<http://dx.doi.org/10.1016/j.eurpsy.2018.07.008>.

Robert, P., Onyike, C. U., Leentjens, A. F., Dujardin, K., Aalten, P., Starkstein, S., ... & Byrne, J. (2009). Proposed diagnostic criteria for apathy in Alzheimer's disease and other neuropsychiatric disorders. *European Psychiatry*, 24(2), 98-104
<https://doi.org/10.1016/j.eurpsy.2008.09.001>.

Santangelo, G., Barone, P., Cuoco, S., Raimo, S., Pezzella, D., Picillo, M., ... & Vitale, C. (2014). Apathy in untreated, de novo patients with Parkinson's disease: validation study of Apathy Evaluation

<http://dx.doi.org/10.29009/ijres.8.4.2>

Scale. *Journal of Neurology*, 261, 2319-2328,
<https://doi.org/10.1007/s00415-014-7498-1>.

Starkstein, S. E., & Leentjens, A. F. (2008). The nosological position of apathy in clinical practice. *Journal of Neurology, Neurosurgery & Psychiatry*, 79(10), 1088-1092, <https://doi.org/10.1136/jnnp.2007.136895>.

Steffens, D. C., Fahed, M., Manning, K. J., & Wang, L. (2022). The neurobiology of apathy in depression and neurocognitive impairment in older adults: a review of epidemiological, clinical, neuropsychological and biological research. *Translational psychiatry*, 12(1), 525,
<https://doi.org/10.1038/s41398-022-02292-3>.

Tay, J., Morris, R. G., & Markus, H. S. (2021). Apathy after stroke: diagnosis, mechanisms, consequences, and treatment. *International Journal of Stroke*, 16(5), 510-518,
<https://doi.org/10.1177/1747493021990906>.

Toloraia, K., Meyer, A., Beltrani, S., Fuhr, P., Lieb, R., & Gschwandtner, U. (2022). Anxiety, depression, and apathy as predictors of cognitive decline in patients with Parkinson's disease—a three-year follow-up study. *Frontiers in Neurology*, 13, 792830,
<https://doi.org/10.3389/fneur.2022.792830>.

Twenge, J. M., & Campbell, W. K. (2019). Media use is linked to lower psychological well-being: Evidence from three datasets. *Psychiatric Quarterly*, 90, 311-331, <https://doi.org/10.1007/s11126-019-09630-7>.

Ubukata, S., Ueda, K., Fujimoto, G., Ueno, S., Murai, T., & Oishi, N. (2022). Extracting apathy from depression syndrome in traumatic brain injury by using a clustering method. *The Journal of Neuropsychiatry and*

<http://dx.doi.org/10.29009/ijres.8.4.2>

Clinical Neurosciences, 34(2), 158-167,

<https://doi.org/10.1176/appi.neuropsych.21020046>.

Zolotareva, A. (2020). Psychometric analysis of the new apathy scale. Psychology.

Journal of Higher School of Economics, 17(2), 191-209.

<https://doi.org/10.17323/1813-8918-2020-2-191-209>