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Examining the Psychometric Indicators of Academic Procrastination Scale Among Final Year Students of Public High Schools in Yasouj City

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ABSTRACT

Objective: The current investigation was undertaken with the objective of examining the psychometric metrics of the academic procrastination scale among final year students in public high schools located in Yasouj city.

Methods: This inquiry is classified as descriptive research with a correlational design. The statistical population for this study comprised all final year students enrolled in public high schools in Yasouj, amounting to a total of 4000 individuals. The sample size was determined to be 380, utilizing Cochran's formula while considering potential subject attrition. A multi-stage cluster sampling approach was employed to select the cohort of students under investigation. To assess the variable of academic procrastination, the Sawari scale (2013) was utilized. The data from this study were subjected to analysis through descriptive statistical techniques, specifically by means of mean and standard deviation measures, and through inferential statistical methods via confirmatory factor analysis.

Results: The findings of this research indicated that the factor loadings for all items within this scale were at an optimal threshold (exceeding .30). Furthermore, the fit indices for the evaluated model fell within an acceptable range and achieved the requisite significance level (P<.05).

Conclusions: Consequently, the current scale is deemed suitable for the assessment of academic procrastination among final year high school students, and its findings may contribute to the field of psychological research.

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Introduction

The examination and identification of the factors influencing students' academic progression constitute a critical component in the achievement of educational outcomes. The trajectory of academic advancement may be either hindered or facilitated by a myriad of individual and societal determinants, among which academic procrastination is particularly salient (Zarezadeh et al., 2024). The act of procrastination, defined as the deferment of tasks to a later time, is so prevalent that it may be construed as an intrinsic human propensity (Rahimi & Sedaghat Khah, 2022). While procrastination is not invariably detrimental, it often engenders undesirable and potentially irreversible repercussions by obstructing progress and impeding the attainment of objectives (Jokar & Delavarpour, 2007). Ferrari and Patel (2004) characterize procrastination as the intentional and persistent deferral of the initiation and completion of tasks, culminating in feelings of pressure and urgency. Furthermore, procrastination is conceptualized as a deficiency in self-regulation coupled with a behavioral inclination to postpone actions requisite for the realization of goals (Hosseini & Khayyer, 2009). In their exploration of procrastination, Wohl et al. (2010) delineate two fundamental components: firstly, procrastination manifests as a syndrome that precipitates considerable physical and psychological detriment to the individual, and secondly, the individual engages in irrational avoidance of executing a particular task or tasks. Calabrese and Tucker-Ladd (1991) posits that individuals who engage in regular introspection regarding their procrastination may uncover the underlying causes of their inactivity. The incidence of procrastination among the student population has been estimated to range from approximately 40-60%, with certain studies reporting rates as high as 95% (Fritzsche et al., 2003; Strunk et al., 2013).

Within the expanding body of empirical literature, a variety of variables have been identified that scholars assert contribute to individual performance, with procrastination being one of the most significant. Procrastination represents a behavioral issue that is highly prevalent and is intrinsically linked to the academic standing of students. Due to its intricate nature and the interplay of cognitive, emotional, and behavioral components, procrastination manifests in diverse forms, including academic procrastination, decision-making procrastination, neurotic procrastination, and obsessive procrastination (Farid et al., 2018). Among these manifestations, academic procrastination is the most frequently encountered form among students (Pala et al., 2011). This specific type of procrastination sees students postponing their homework and neglecting academic

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responsibilities (Hussain & Sultan, 2010). While procrastination may not invariably yield adverse outcomes, it commonly results in undesirable and irreparable consequences that hinder progress and obstruct goal attainment; this phenomenon is characterized by its cognitive, emotional, and behavioral complexities and manifests in various forms (Karas & Spada, 2009). Theorists in this domain have articulated procrastination as the predominant and enduring inclination of individuals to defer activities, which is almost invariably accompanied by anxiety and regarded as a challenge within the educational framework, serving as a disruptive force in the academic progression of numerous students (Simpson & Pychyl, 2009). Procrastination, in essence, signifies negligence and the deferral of responsibilities. The repercussions of procrastination adversely affect the personality, learning, and overall success of students across all educational levels (Klassen et al., 2008). Wäschle et al. (2014) assert that excessive procrastination impairs students' ability to effectively self-regulate and organize their efforts to attain academic objectives, thereby contributing to the emergence of depressive and anxious states. Furthermore, procrastination diminishes self-efficacy and optimism regarding task completion (Steel, 2007), adversely impacts sleep quality, dietary habits, and physical exercise routines (Pala et al., 2011), precipitates heightened anxiety and apprehension, and leads to diminished self-worth (Pychyl et al., 2002), engenders performance-related anxiety (Zacks & Hen, 2018), and is associated with unethical behaviors such as cheating, plagiarism, as well as increased consumption of substances such as alcohol, tobacco, and caffeine (Malobabic et al., 2020). Midgley et al. (1996) demonstrated that procrastination correlates with maladaptive behaviors and self-destructive outcomes, including fear of failure, avoidance of tasks, performance anxiety, insufficient self-regulation, lack of accountability, and diminished academic achievement.

Conversely, it engenders detrimental and harmful consequences for mental health, particularly in the form of depression and anxiety. Symptoms of depression encompass fatigue, debilitating headaches, insomnia, hypertension, and gastrointestinal issues such as ulcers. Academic procrastination is linked with adverse behaviors including suboptimal academic performance, irrational cognitive patterns, academic dishonesty, low self-esteem, neurotic traits, feelings of guilt, and depressive states, in addition to various forms of academic anxiety, such as test anxiety and social anxiety, which not only obstruct academic advancement but also adversely affect students' overall quality of life (Fritzsche et al., 2003).

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Procrastination is a phenomenon that is far from novel. Over a century ago, William James, a foundational figure in psychology, introduced the concept of procrastination within the psychological domain. Steele further traced the roots of procrastination back to 800 BC (Steel, 2007). Modern psychologists are increasingly engaging with the topic of procrastination and the myriad factors that influence it. Nonetheless, procrastination continues to remain one of the enigmatic aspects of human behavior.

Empirical studies indicate that procrastination is a pervasive and universal issue ((Rozental & Carlbring, 2014), with 15-20% of adults experiencing procrastination as a chronic challenge (Yan & Zhang, 2022). While some scholars posit that procrastination may yield positive and functional outcomes (Schraw et al., 2007), a significant number of experts contend that procrastination is predominantly dysfunctional and detrimental (Moonaghi & Beydokhti, 2017). Procrastination is characterized by a deficiency in self-regulation and a proclivity to postpone necessary actions required to attain goals. Simpson and Pychyl (2009) articulated academic procrastination as a widespread and enduring inclination to defer activities, frequently accompanied by anxiety, which is perceived as a systemic challenge within the educational framework and a hindrance to academic progress for the majority of students.

Although academic procrastination constitutes a characteristic often regarded as a facet of students' academic experiences, there exist several compelling rationales for scrutinizing procrastination as a deleterious factor for students; research indicates that procrastination may contribute to subpar academic performance, the emergence of negative emotional states such as embarrassment and guilt, depression, and diminished motivation (Rebetez et al., 2018), academic setbacks, and the manifestation of psychological issues such as depression and anxiety (Constantin et al., 2018). Early empirical investigations conducted by Romash (2020) revealed that approximately 90 percent of students engage in procrastination at least on occasion, with 50 percent of this population demonstrating procrastination behaviors at least half of the time or more. Procrastination culminates in unproductive efforts. It acts as a temporal thief, engendering feelings of guilt within the individual and altering the perceptions of others towards him. Procrastination serves as a mechanism to evade fully engaging in the present moment (Saddler & Sacks, 1993). Academic procrastination, which encompasses the tardy completion of homework, exam

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preparation, and the last-minute submission of term projects ((Moonaghi & Beydokhti, 2017); thus, in light of the considerable prevalence of procrastination among students, it is imperative for educational officials, planners, and stakeholders within the educational system to prioritize the domain of goal-setting and to implement strategies aimed at redirecting goal orientation in order to mitigate or rectify procrastination; for procrastination, on one hand, signifies a deficiency in self-regulation among students, and on the other hand, constitutes a maladaptive behavior and an ineffective defensive mechanism that individuals resort to in order to evade failure, preserve self-esteem, and maintain personal value, ultimately yielding no advantageous outcomes for the procrastinators. An increased focus on this phenomenon and a rigorous, expert-driven approach could represent a significant advancement towards addressing the educational challenges faced by learners across various academic levels. This underscores another critical necessity of the current research endeavor. Moreover, it may be posited that students who procrastinate exhibit inadequacies in managing interpersonal conflicts, problem-solving capabilities, memory retention, information processing, attention—a pivotal and intricate dimension—and social competencies in interpersonal interactions, thereby positioning them at a comparatively lower level than their peers (Rostamoghli et al., 2013).

In light of the aforementioned considerations, the present investigation aspires to establish a foundation for exploring the construct of academic procrastination within the realm of psychological research by scrutinizing the psychometric properties of the academic procrastination scale among final-year students enrolled in public high schools in Yasuj. The hypotheses posited for this inquiry are as follows:

1. The academic procrastination scale demonstrates satisfactory validity.
2. The academic procrastination scale exhibits adequate reliability.

Material and Methods

This investigation is characterized as descriptive with respect to its practical objectives and methodologies for data acquisition. The statistical demographic for this study comprised all final-year students attending public secondary schools within Yasuj city (totaling 4000 individuals) who were enrolled during the academic year corresponding to 2020. In order to derive the sample of students for analysis, a multi-stage cluster sampling technique was employed. Initially, Yasuj city

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was stratified into three distinct regions (north-central-south), from which four secondary schools were randomly selected from each region, culminating in a total of 12 schools chosen for the high school segment. At this stage, 350 individuals were extracted through multi-stage cluster random sampling from the cohort of final-year secondary students in Yasuj city. Given that correlational research necessitates a minimum sample size ranging from 30 to 50 participants, this study opted to include 380 individuals as the research sample to enhance external validity (Anderson et al., 2008). The subsequent instruments were utilized for data collection.

The Cochran formula was employed to ascertain the requisite sample size, calculated under the presumption of a 95% confidence level (α=0.05). The z or t value within the Cochran formula at a 95% confidence level was established at 1.96. The parameter d (tolerable error) was designated as 0.2 or 0.20 or lower to ensure that the statistical power of the test does not fall below 80%, with a d value of 0.05 being applied in this context. The values of p and q were set at 0.5 to facilitate the computation of the maximum sample size. The statistical sample of students was computed utilizing the Cochran formula as delineated. Taking into account that the current research stipulates a sample size of 350 individuals based on the known population size, the investigator initially disseminated 380 questionnaires to bolster external validity and to account for potential participant attrition and the occurrence of erroneous data within the scales.

The Sevari et al. (2020) scale was employed to assess the construct of academic procrastination. This instrument, which was initially devised and standardized in Ahvaz, comprises 12 items. The scale encompasses three dimensions: intentional procrastination (comprising 5 items), procrastination attributable to physical-mental fatigue (comprising 4 items), and procrastination due to inadequate planning (comprising 3 items). Adjacent to each item is a five-point Likert scale, with the following gradations: never = 1, rarely = 2, occasionally = 3, most of the time = 4, and always = 5. The range for the intentional procrastination subscale is delineated between 5 and 25, while the range for the procrastination due to physical-mental fatigue subscale is established between 4 and 20, and for the lack of planning subscale, between 3 and 25. Conversely, the total score for the procrastination scale is confined within the limits of 12 and 60. To evaluate the validity of this questionnaire, Tuckman (2005) procrastination scale was utilized, yielding results indicative of a significant correlation between the two scales, thus affirming the acceptable validity of the instrument. The validity of this questionnaire was further scrutinized through confirmatory

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factor analysis, which revealed that all items possess satisfactory factor loading. Additionally, Cronbach's alpha coefficient was employed to ascertain the reliability of the academic procrastination scale. Sevari et al. (2020)) reported Cronbach's alpha coefficients for the dimensions of intentional procrastination (5 items), procrastination due to physical-mental fatigue (4 items), and procrastination due to lack of planning (3 items) as 0.77, 0.60, and 0.70, respectively, while the overall scale exhibited a Cronbach's alpha coefficient of 0.85.

Ethical considerations: The current investigation was executed in the field phase subsequent to the acquisition of requisite approvals from the Education Department of Yasuj, coupled with the adherence to ethical standards, coordination with the targeted educational institutions, elucidation of the research objectives, and procurement of informed consent from the student participants. The data derived from this study were analyzed in the descriptive statistics segment via mean and standard deviation metrics, and in the inferential statistics segment through confirmatory factor analysis. The analytical processes were conducted within the SPSS-24 and Amos software.

Results

Table 1 delineates the mean and standard deviation pertaining to the cumulative score of academic procrastination.

Table 1. Descriptive statistics indicators of the variable of academic procrastination

Variable	Mean	SD	Min.	Max.	Skewness	Kurtosis
Academic procrastination	30.60	10.93	12	61	0.27	0.76

As indicated in Table 1, the mean and standard deviation of the cumulative score for academic procrastination are (30.60, 10.93), respectively. Furthermore, it illustrates that the skewness and kurtosis of the distribution of the participants' scores approximate the characteristics of a normal distribution. Prior to executing the inferential analyses, the normality of the dataset was assessed utilizing the Shapiro-Wilk and Kolmogorov-Smirnov tests, with the outcomes presented in Table 2.

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Table 2. Results of the tests related to the normality of the data

Variable	S-W	P	K-S	P
Academic procrastination	0.926	0.083	0127	0.18

As evidenced in Table 2, both calculated statistics exceed the alpha level of 0.05; consequently, the normality of the dataset is affirmed.

Examination of the first hypothesis

Figure 1 displays the output generated by the Amos software in relation to the confirmatory factor analysis of the academic procrastination scale employing the maximum likelihood estimation method.

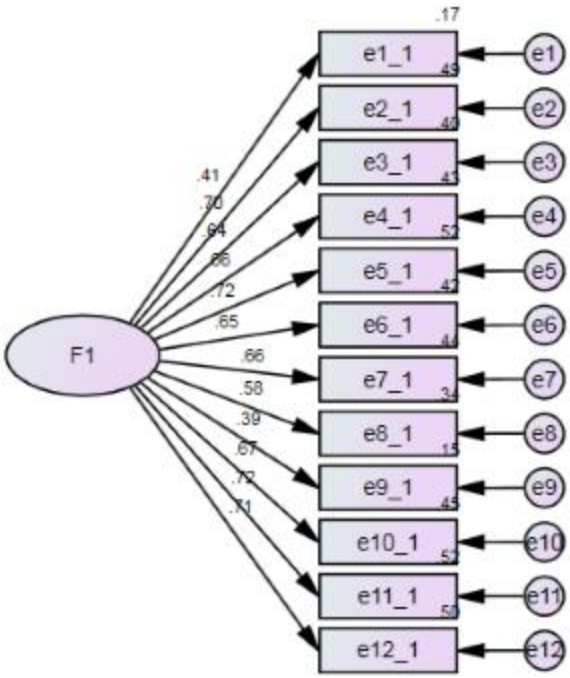

Figure 1. Confirmatory factor analysis diagram of the confirmatory procrastination scale

Table 3 enumerates the factor loadings ascertained for the items comprising the academic procrastination scale.

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Table 3. Factor loadings related to the items of the academic procrastination scale

Item	Estimated value	Standard value	S.E	C.R	P
1	1	041	-	-	0.001
2	1.43	0.70	0.21	6.80	0.001
3	1.39	0.63	0.20	6.87	0.001
4	1.44	0.65	0.22	6.53	0.001
5	1.71	0.71	0.23	6.50	0.001
6	1.55	0.64	0.33	0.65	0.001
7	1.58	0.66	0.23	6.64	0.001
8	1.34	0.58	0.21	6.24	0.001
9	1.48	0.39	0.28	5.12	0.001
10	1.63	0.67	0.24	6.64	0.001
11	1.70	0.72	0.25	6.81	0.001
12	1.67	0.70	0.24	6.81	0.001

According to Table 3, all items within the academic procrastination questionnaire exhibit acceptable factor loadings (exceeding 0.30), thereby validating the confirmatory factor analysis of the research inquiries. Table 4 enumerates the fit indices pertinent to the factor analysis model.

Table 4. Fit indices of the factor analysis model

Indices	CFI	RMSEA	X^2/DF	DF	X^2
Obtained value	0.98	0.037	1.42	48	68.22
Favorable value	> 0.90	< 0.05	1-5	-	-

In accordance with the findings presented in Table 4, the root mean square error of approximation (RMSEA) index coefficient is calculated at (0.037), the comparative fit index (CFI) is determined to be 0.98, and the chi-square index relative to the degrees of freedom (X^2/DF) is assessed at 1.421, signifying an adequate and moderate fit for the proposed model. In summary, the aforementioned results substantiate that the academic procrastination scale possesses commendable validity, thereby confirming the first hypothesis of the research.

The reliability of the academic procrastination scale was evaluated through the application of Cronbach's alpha and split-half methodologies. The results obtained from these assessments, in conjunction with the reliability outcomes from the primary study, are documented in Table 5.

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Table 5. Scale reliability coefficients

Variable	Cronbach Alpha	Split-half method	Savari Study Alpha
Academic procrastination Total scale)	0.79	0.80	0.85
Intentional procrastination	0.69	0.72	0.77
Procrastination due to physical-mental fatigue	0.62	0.64	0.60
Procrastination due to lack of planning	0.65	0.69	0.70

The findings presented in Table 5 indicate that the reliability of the scale and its subscales associated with academic procrastination is deemed satisfactory (surpassing 0.60). Accordingly, the second hypothesis of the research is corroborated.

Discussion

The findings of the current investigation align with the outcomes reported in the research conducted by Fathi Azar et al. (2017), Rostamoghli et al. (2013), and Ghanadi et al. (2018). According to the scholarly contributions of Grunschel et al. (2013), there exist three predominant A) issues that contribute to the phenomenon of procrastination:

The presence of an inferiority complex; which manifests due to the following factors:

1- Individuals possess a desire to execute their tasks with both proficiency and thoroughness.

2- They seek to cultivate affection and trust from their social peers.

3- They aspire to surmount their erroneous perceptions stemming from intrinsic personality characteristics by engaging in diligent behavior.

The salient traits of individuals exhibiting an inferiority complex include:

1- A self-perception of inadequacy and deficiency in talent.

2- An inability to perform tasks to an acceptable standard.

3- A pattern of failure in undertaking pivotal responsibilities.

4- A pessimistic outlook regarding future prospects.

5- A life substantially influenced by the aforementioned cognitive patterns.

B) Insufficient tolerance and frustration; manifestations of anger and hostility; the allocation of time and energy toward opposition and conflict often represent productive resources that are squandered; however, at times, the repression of anger reflects a lack of action or negligence, commonly referred to as passive aggression.

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C) An inclination toward immediate gratification; an impatience in the pursuit of desires and the attainment of happiness.

From the vantage point of researchers; the determinants of procrastination can be attributed to the following factors:

Inadequate time management abilities, diminished self-efficacy beliefs, discomfort arising from task difficulty, neurotic tendencies, irrational cognitive frameworks, concentration deficits, anxiety and dependency, low self-esteem, apprehension regarding negative evaluation, unrealistic expectations, maladaptive work habits, work aversion, fear of engagement, and lack of energy (Sirin, 2011). Furthermore, concerning the precursors of procrastination, scholars and theorists have identified various contributing factors, including anxiety and dependency, fear of negative evaluations, neuroticism, energy deficits, behavioral rigidity, learned helplessness, perfectionism, and insufficient self-regulation (Karas & Spada, 2009).

While transient procrastination may yield beneficial outcomes, such as diminished psychological stress during task execution and a reduction in physical ailments, chronic procrastination culminates in behavioral consequences such as delayed assignment submissions, rushed learning, examination anxiety, social phobia, reliance on the strategy of self-prediction of outcomes (illusory control), fear of failure, and suboptimal academic performance. In the long-term, such patterns may result in psychological detriments, including depression and anxiety (Grunschel et al., 2013). Procrastination is an action that, at a superficial level, seeks to enhance life satisfaction; however, in the majority of instances, it yields no outcomes other than stress, confusion, and a series of failures. It is pertinent to emphasize that procrastination is not invariably detrimental; nevertheless, in numerous cases, it may engender adverse and irreparable consequences by obstructing progress and hindering the attainment of objectives (Moonaghi & Beydokhti, 2017). Research by Midgley et al. (1996) demonstrated that procrastination is correlated with negative behaviors and repercussions such as self-harm, fear of failure, task avoidance, performance avoidance, insufficient self-regulation, lack of responsibility, and diminished achievement. Conversely, it precipitates negative and deleterious effects on mental well-being (including depression and anxiety). Depression manifests through a variety of symptoms, including profound fatigue, debilitating headaches, insomnia, elevated blood pressure, and gastric ulcers.

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Academic procrastination is correlated with detrimental behaviors, including subpar academic performance, irrational cognitive patterns, instances of academic dishonesty, diminished self-worth, neurotic tendencies, feelings of guilt, and depression, in addition to various educationally-related anxieties such as test-related apprehension and social anxiety, which impede not only academic advancement but also adversely influence the overall quality of life for students (Fritzsche et al., 2003).

The scholarly examination of procrastination can be approached from two overarching perspectives:

a) Procrastination has been scrutinized through the lens of researchers;

1- A faction posits that procrastination constitutes a behavioral issue; within this framework, procrastination is perceived as a behavioral concern, with the objective of intervention being to diminish the duration or frequency of procrastination and to enhance the duration or frequency of engagement in study or productive activities.

2- Conversely, another faction contends that procrastination arises from motivational deficits: the underlying cause is not attributed to inertia or a lack of drive, but rather to the propensity of procrastinators to gravitate towards alternative pursuits.

3- Procrastination may also be conceptualized as a habitual pattern that contributes to a decline in the individual's self-efficacy expectations regarding their activities.

4- An additional group posits that procrastination is fundamentally a cognitive issue: from this perspective, the genesis of procrastination is rooted in erroneous and irrational beliefs and thoughts concerning the conditions and outcomes of various undertakings.

5- A further cohort asserts that procrastination is indicative of a personality disorder: from this standpoint, procrastination is characterized as a moral failing, encompassing traits such as a deficiency of willpower, a lack of perseverance, lethargy, inattentiveness, and a diminished drive for achievement (Shehne Yailagh et al., 2006).

b) Certain scholars propose that procrastination is associated with two principal personality frameworks:

1- The three-factor personality model, which encompasses extraversion, psychoticism, and neuroticism (Zandieh & Jafariharandi, 2020).

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2- The five-factor personality model, which includes neuroticism, extraversion, agreeableness, and conscientiousness (Barzegar bafrooei & Aref manesh, 2019).

It is recommended that forthcoming studies explore the influence of contextual, motivational, and cognitive variables in relation to procrastination. Additionally, meta-analytical approaches should be employed to investigate the factors that contribute to procrastination among students. It is also advisable that alternative methodologies, such as comprehensive case interviews, be utilized in lieu of self-report questionnaires in subsequent research endeavors.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Islamic Azad University.

Author contributions

All authors contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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