EXAMINING THE WORK NEED SATISFACTION SCALE IN THE ONLINE PLATFORM GIG WORK ENVIRONMENT: A STRUCTURAL AND CONTEXTUAL ANALYSIS

Lucian SFETCU[1]

Abstract: *The Work Need Satisfaction Scale (WNSS) is a widely validated instrument designed to assess the satisfaction of basic psychological needs in the workplace, as informed by the Psychology of Working Theory and Self-Determination Theory. While it has demonstrated robust psychometric properties across diverse populations, its applicability to online gig workers—a growing segment of the labor market—remains underexplored. In this study, we examined the factor structure of the WNSS among 513 European Union-based online gig workers recruited through the Clickworker platform. Confirmatory factor analysis of the original 20-item, five-factor model (survival, social contribution, autonomy, competence, and relatedness) indicated a poor fit in this population. Subsequent exploratory factor analysis suggested a more parsimonious 12-item, three-factor solution (survival, social contribution, and competence). The autonomy and relatedness dimensions, central to traditional employment contexts, did not emerge as well-formed factors in the gig work sample. These findings highlight the need to adapt the WNSS to better capture the nuances of online platform work. Future research should refine the scale's items to more accurately reflect the gig economy's unique interplay of algorithmic management, flexible scheduling, and virtual social interactions. Such adaptations can inform interventions and platform designs that promote greater need satisfaction and well-being among online gig workers.*

Keywords: *Work Need Satisfaction Scale, Gig Economy, Online Platform Work, Basic Psychological Needs, Self-Determination Theory, Psychology of Working Theory*

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[1] Lecturer, PhD., Department of Sociology, Social Work and Human Resources, Faculty of Philosophy and Social-Political Sciences, „Alexandru Ioan Cuza" University of Iasi, Romania, e-mail: lucian.sfetcu@gmail.com, ORCID: https://orcid.org/0000-0001-8510-4228

Introduction

Psychology of Working Theory (PWT)

The Psychology of Working Theory (PWT) is a comprehensive framework aimed at understanding the work experiences of all individuals, particularly those facing marginalization, poverty, or challenging transitions (Duffy et al., 2016). PWT emphasizes the concept of decent work as a central variable and explores its contextual predictors, mediators, and outcomes (Blustein et al., 2018; Duffy et al., 2016). The theory posits that economic constraints and experiences of marginalization influence access to decent work through factors like work volition and career adaptability (Duffy et al., 2018). Building on earlier work, PWT highlights how work fulfills basic human needs for survival, connectedness, and self-determination (Blustein, 2006). The theory has been validated across diverse populations, including Turkish working adults (H. J. Kim et al., 2023), racially and ethnically diverse employed adults (Duffy et al., 2018), and sexual minorities (Douglass et al., 2017). Recent efforts have focused on standardizing construct measurement and expanding the theory's application in research and practice (Blustein et al., 2019; Duffy et al., 2023).

Self-Determination Theory (SDT)

Self-Determination Theory (SDT) is a macro-theory of human motivation that emphasizes the role of basic psychological needs—autonomy, competence, and relatedness—in fostering well-being and optimal functioning (Deci & Ryan, 2000). In the workplace context, SDT posits that the satisfaction of these needs leads to intrinsic motivation and positive work outcomes, while need frustration can result in maladaptive behaviors and decreased well-being (Van Den Broeck et al., 2016). SDT has been widely applied to understand employee motivation, engagement, and satisfaction across various work settings (Gagné & Deci, 2005; Olafsen et al., 2017).

Work Need Satisfaction Scale (WNSS)

The Work Need Satisfaction Scale (WNSS) is a validated instrument that measures the fulfillment of basic psychological needs in the workplace, drawing on the principles of the Psychology of Working Theory (PWT) and Self-Determination Theory (SDT) (Autin et al., 2019). It assesses five

core needs: survival, social contribution, autonomy, competence, and relatedness (Autin et al., 2019). By including survival and social contribution needs, the WNSS extends beyond the traditional three SDT constructs to capture more contextual factors, particularly those relevant to individuals from marginalized groups (Duffy et al., 2016).

Most studies support a five-factor structure of the WNSS, reflecting the three SDT-based needs (autonomy, competence, and relatedness) as well as the additional dimensions of survival and social contribution (Autin et al., 2019, 2023; J.-H. Kim et al., 2021; Xu et al., 2022). The scale has been validated in multiple languages and cultural contexts, including Korean (J.-H. Kim et al., 2021), Chinese (Xu et al., 2022), and Spanish (Autin et al., 2023). These studies have consistently shown that the WNSS demonstrates strong reliability, validity, and measurement invariance across diverse demographic groups.

Need Satisfaction in the Gig Economy
Traditional measures of need satisfaction may not fully capture the experiences of workers in non-traditional employment arrangements, such as gig work (Allan & Blustein, 2022). Gig work is characterized by flexibility, autonomy, and task variety but often lacks stability, social support, and opportunities for advancement (Kuhn & Maleki, 2017). These unique features necessitate the adaptation of existing scales or the development of new instruments to accurately assess need satisfaction in this context.

The gig economy, exemplified by platforms like Uber, Lyft, and Upwork, offers flexible work opportunities but raises concerns about worker protection, job quality, and the fulfillment of psychological needs (De Stefano, 2015; Donovan et al., 2016). Gig work often involves low pay, irregular hours, limited social interaction, and a lack of traditional employment benefits (Wood et al., 2019). These conditions can impede the satisfaction of basic psychological needs, particularly relatedness and security (Bajwa et al., 2018).

Recent research on gig work highlights the challenges gig workers face in satisfying their basic psychological needs. Studies have shown that gig workers often experience need frustration due to precarious work conditions, lack of social support, and limited opportunities for growth (Gandini, 2019; Graham et al., 2017). Adaptations of need satisfaction scales, such as the Basic Psychological Need Satisfaction and Frustration

Scale, have been used to assess these experiences in gig work contexts (Nunes et al., 2023). Findings indicate that need satisfaction is linked to better well-being, job satisfaction, and motivation among gig workers (Behl et al., 2021).

Technological Influences on Need Satisfaction

The role of technology in gig work adds another layer of complexity to need satisfaction. Algorithmic management and digital platforms can both enable and hinder the satisfaction of psychological needs (Kellogg et al., 2020). For instance, while technology can provide flexibility and autonomy, it can also lead to increased surveillance and reduced autonomy due to algorithmic control (Shapiro, 2018). Understanding how technological factors influence need satisfaction is crucial for comprehensively assessing gig workers' experiences.

Social Needs in Gig Work

Social needs are fundamental human requirements that, when unmet, can lead to decreased well-being and increased health issues (Bruggencate et al., 2018). Gig workers often report feelings of isolation due to the solitary nature of their work and the lack of traditional workplace interactions (Pesole, A. et al., 2018). Addressing social needs in the gig economy involves creating opportunities for community building and peer support, which can enhance relatedness and overall satisfaction (Taylor et al., 2017).

Rationale for the Current Study

Given the unique characteristics and challenges of online platform gig work, there is a critical need to understand how basic psychological needs are satisfied in this context. The WNSS provides a comprehensive tool for assessing need satisfaction, including factors particularly relevant to online platform gig workers, such as survival and social contribution needs (Autin et al., 2019). Validating the WNSS in a gig work context would offer valuable insights into gig workers' well-being, motivations, and work outcomes. It could also inform interventions, policies, and platform designs aimed at improving gig work conditions and enhancing worker satisfaction.

Methodology

This survey tool, combining the WNSS scale with socio-demographic questions, was administered via the limesurvey.org platform. Limesurvey is

an advanced online survey software tool, commonly used to collect quantitative data. Later, the survey was shared on the clickworker.com platform. Clickworker is one of the most famous online job platforms in the world, bringing freelancers together with businesses or persons in need of help in the execution of a variety of micro-jobs and other digital projects. It is an online internet platform; it is an open-call marketplace where workers execute tasks requesting the cognitive skills of humans, which could not be aptly automated. The research took place from March 9th, 2023, to June 6th, 2023, with the subjects being recruited via Clickworker. We have utilized the Clickworker platform for our recruitment process in order to make sure that all respondents belonged to our target population-that is, people working in the online platform work economy. The inclusion criteria for participants included residents of the European Union, proficiency in the English language because the questionnaire would be provided only in that language and being at least 18 years old.

Participants

We collected valid and complete answers from 513 working adults, 18 to 75 years old, with a mean age of 36.68 (SD = 10.545). Of the 513 respondents, 238 (46.39%) identified themselves as women and 275 (53.61%) identified themselves as men. All respondents were from EU countries, most of them being from Germany (24.76%), Italy (15.59%), Spain (14.04%), Portugal (10.33%), France (9.94%), Austria (6.63%), Romania (5.85%), and other EU countries with < 3% each.

In terms of last education degree, 32.55% declared a high school degree, 31.97% reported a bachelor's degree, 27.29% reported a master's degree, 3.51% reported a PhD or higher degree, 2.92% reported a Less than high school degree and 1.76 % reported other educational degree.

The employment status of the respondents, other than their online gig work activity, were Employed full-time (40+ hours a week) - 53.46% of men and 34.03% of women, Employed part-time (less than 40 hours a week) - 8% of men and 18.5% of women, Self-employed - 14 .91% of men and 16.39% of women, Student – 9.5% of men and 8.4% of women, Unemployed (currently looking for work) – 8% of men and 9.66% of women, Unemployed (currently not looking for work) – 1.82% of men and 7.14% of women, the remaining percents being for Never been employed, Retired or Other.

For 68.23% of the respondents, the main income comes from the Classic job, for 18.71% from online work platforms, for 4.48% of the respondents, the main income comes from Pension and for 8.58% of them, from Other sources.

In terms of time allocated for online gig work, most of the respondents (47.95%) reported less than 5 hours/week, 26.32% reported 5-10 hours/week, 12.09% reported 10-20 hours/week, 7.21% reported 20-30 hours/week, 4.09% reported 30-40 hours/week and 2.34% reported More than 40 hours/week.

Of all respondents, 42.89% reported a household income of Less than 2.000 EUR, 40.16% reported a household income of 2.000 – 4.000 EUR, 10.92% reported 4.000 – 6.000 EUR and 6.04% reported a household income higher than 6.000 EUR.

Data Analysis

Preliminary analysis
Before the analysis, we assessed the skewness and kurtosis of all the items. The skewness of the scale items ranged between -0.049 to -0.851 and their kurtosis ranged from -1.159 to 0.455. All values being ≤ |1,5| indicates a normal distribution for all the measured variables.

The entire scale shows good reliability, with a Cronbach's a = .95. In the same way, a = .95 for the Survival sub-scale, a = .92 for the Social Contribution sub-scale, a = .94 for the Competence scale, a = .92 for the Relatedness sub-scale and a = .82 for the Autonomy sub-scale.

The average variance extracted (AVE) for the 5 factors were AVE = .83 for the Survival factor, AVE = .75 for the Social Contribution factor, AVE = .79 for the Competence factor, .76 for the Relatedness factor and AVE = .55 for the Autonomy factor.

Confirmatory Factor Analysis – Initial 20-Items, 5-Factor Model
We conducted a Confirmatory Factor Analysis (CFA) using JASP 0.19.1 with maximum likelihood estimation. We tested the goodness-of-fit for the 5-factor 20 item model (Autin et al., 2019).

The chi-square statistic (χ^2) of 862.167 with 160 degrees of freedom (df) yielded a χ^2/df ratio of 5.389 and a highly significant p-value (< .001).

The Root Mean Square Error of Approximation (RMSEA) was 0.092. Specific fit statistics for the CFA measurement model provided additional depth to the assessment: the Comparative Fit Index (CFI) = .927, Tucker—Lewis Index (TLI) = .913, the Relative Non-centrality Index (RNI) = .927 and the McDonald Fit Index (MFI) = .504.

The Standardized Root Mean Residual (SRMR) of .062 was also computed.

The reliability for the scale and for each construct is shown in Table 1:

Table 1: Reliability of the Initial 20-Item, 5-Factor Model

Reliability	
	Coefficient α
Survival needs	0.95
Social Contribution needs	0.922
Competence needs	0.935
Relatedness needs	0.922
Autonomy needs	0.824
total	0.949

In Table 2, we can see the Average variance extracted for each factor.

Table 2: Average variance extracted for the Initial 20-Item, 5-Factor Model

Average variance extracted	
Factor	AVE
Survival needs	0.826
Social Contribution needs	0.751
Competence needs	0.789
Relatedness needs	0.756
Autonomy needs	0.545

Discussion on the Confirmatory Factor Analysis – Initial 20-Items, 5-Factor Model

The CFA results of applying the model proposed by Autin et al. (2019) to our population resulted in a poor fit.

First, the Cronbach's alpha of the Autonomy sub-scale was good at $a = .82$, but not as good as the score of the others (Verma & Abdel-Salam, 2019), which were all above $a = .92$.

Second, the average variance extracted was very good for all factors except the Autonomy, where AVE = .55, a value that is very close to the .5 cutoff value (Cheung et al., 2024).

Although this statistic is sensitive to the sample size, chi-square indicated a poor fit of the model to the observed population ($\chi^2/df = 5.389$), according to Byrne et al. (1989).

According to Hu & Bentler (1999), CFI, TLI and RNI should be above .95 for a good fit model, MFI should be above .90, RMSEA should be below .06 and SRMR should be ≤ .08.

Given these sub-par results, we decided to try and find out why the Work Need Satisfaction Scale (Autin et al., 2019) does not fit our population well, and decided to conduct an Exploratory Factor Analysis (EFA) to see if there are items in the scale that, maybe, are not relevant for the online gig worker.

Exploratory Factor Analysis

To understand why the data did not fit the model very well in the CFA, we conducted an exploratory factor analysis (EFA) with a varimax rotation on all 20 items of the WNSS scale, to identify the underlying structure of the data. Because all items were normally distributed (skewness and kurtosis were ≤ |1,5|), we used the Maximum Likelihood factoring method (Costello & Osborne, 2005).

The analysis, following the Kaiser rule of eigenvalues being greater than 1, suggested a 4-factor model as can be seen in Figure 1. The factor loadings above .3 and communalities are presented in Table 3.

Figure 1: EFA Scree plot
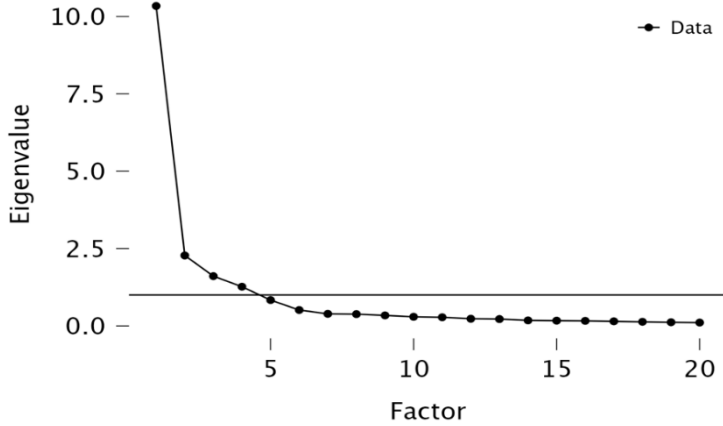
In Table 3, we can see the factor loadings above .3 and communalities.

**Table 3: Factor loadings above .3 and communalities
for the 20-item, five-factor model**

Factor Loadings					
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Communality**
WNSS_01		**0.822**			0.779
WNSS_02		**0.856**			0.839
WNSS_03		**0.874**			0.84
WNSS_04		**0.863**			0.854
WNSS_05		0.32	**0.677**		0.671
WNSS_06			**0.767**		0.79
WNSS_07	0.308		**0.757**		0.813
WNSS_08	0.332		**0.683**	0.359	0.755
WNSS_09	**0.809**				0.825
WNSS_10	**0.88**				0.886
WNSS_11	**0.793**				0.732

Factor Loadings					
	Factor 1	**Factor 2**	**Factor 3**	**Factor 4**	**Communality**
WNSS_12	**0.767**				0.7
WNSS_13	**0.539**			**0.525**	0.638
WNSS_14	**0.5**		0.309	**0.609**	0.762
WNSS_15			0.353	**0.779**	0.861
WNSS_16			0.385	**0.762**	0.85
WNSS_17	**0.487**				0.296
WNSS_18	**0.421**				0.282
WNSS_19	**0.39**		**0.382**	**0.413**	0.541
WNSS_20	**0.361**				0.154

The Kaiser-Meyer-Olkin (KMO) test on all items showed scores above .874, with an overall score of .936, as shown in Table 4.

Table 4: *KMO on all items*

Kaiser-Meyer-Olkin Test	
	MSA
Overall MSA	0.936
WNSS_01	0.94
WNSS_02	0.932
WNSS_03	0.926
WNSS_04	0.923
WNSS_05	0.959
WNSS_06	0.943
WNSS_07	0.941
WNSS_08	0.961
WNSS_09	0.939
WNSS_10	0.917

Kaiser-Meyer-Olkin Test	
WNSS_11	0.949
WNSS_12	0.957
WNSS_13	0.945
WNSS_14	0.951
WNSS_15	0.921
WNSS_16	0.922
WNSS_17	0.892
WNSS_18	0.909
WNSS_19	0.959
WNSS_20	0.874

As we can see in Table 3, item communalities are, in general, very good across the scale, with 3 exceptions: WNSS_17, WNSS_18 and WNSS_20.

Item WNSS_13 is loading higher than .5 on 2 factors, and items WNSS_14 and WNSS_19 are loading higher than .3 on 3 factors.

Discussion on the Exploratory Factor Analysis and the Confirmatory Factor Analysis – Initial 20-Items, 5-Factor Model
The EFA solution with 4 factors is slightly different than the 5-Factor WNSS Scale model proposed by Autin et al. (2019), but not for all items.

The KMO test showed good scores, well above the minimum acceptable .5 (Kaiser, 1974).

Because items WNSS_13 and WNSS_14 are loading higher than .5 on 2 factors, item WNSS_19 is loading higher than .32 on 3 factors and items WNSS_17, WNSS_18 and WNSS_20 show very low communalities, based on the best practices in the literature (Costello & Osborne, 2005), we decided to drop them and test a model without them.

Given that we decided to drop items WNSS_13 and WNSS_14, the Relatedness needs factor remains with only 2 items, forcing us to also drop items WNSS_15 and WNSS_16 from the model in order to have an

accurate last analysis, although these items loaded similarly here and in the 5-factor model.

After all these considerations, we arrive at the following model (Table 5), derived from Autin et al. (2019) 's 5 factor model of the Work Need Satisfaction Scale, that we will try to confirm with a second CFA and, if the fit is considerably better than the original model, will try and explain the differences and why they occur.

Table 5: 12-item, 3-factor model

FACTOR	ITEM (SHORT)	ITEM
SURVIVAL NEEDS	WNSS_01	have the resources to provide nutritious food for myself and my family.
	WNSS_02	have the resources to pay for adequate housing for my family.
	WNSS_03	have the resources to pay for utilities, such as water, heating, and electric, on time
	WNSS_04	have the resources to maintain the health of myself and my family
SOCIAL CONTRIBUTION NEEDS	WNSS_05	make a contribution to the greater social good.
	WNSS_06	feel like I am doing something important for my community.
	WNSS_07	feel a part of something greater by helping to sustain our world.
	WNSS_08	feel like I am making a difference.
COMPETENCE NEEDS	WNSS_09	feel like I am good at my job.
	WNSS_10	feel like I am good at what I do.
	WNSS_11	feel like I know what I'm doing.
	WNSS_12	feel competent.

Confirmatory Factor Analysis of the modified 12-Items, 3-Factor Model

The chi-square statistic (χ^2) = 169.075 with df = 51 and a χ^2/df = 3.315 and p < .001.

The fit indexes for this model are: RMSEA = 0.067, CFI = .98, TLI = .974, RNI = .980 and MFI = .891 and SRMR = .027.

Comparison of the Confirmatory Factor Analyses of the 2 models

The modified model, with only 3 factors, shows a considerably better fit for our population. A comparison between the fit indexes of the two models is presented in Table 6.

Table 6: Comparison of fit between the original 20-item, 5-factor model and the 12-item, 3-factor model

	χ^2/df	RMSEA	CFI	TLI	RNI	MFI	SRMR
Initial 5-factor model	5.389	0.092	.927	.913	.927	.504	.062
Modified 3-factor model	3.315	0.067	.98	.974	.980	.891	.027

Results

The CFA of the modified 12-item, 3-factor model indicates a considerable better fit compared to the initial 20-item, 5-factor model. The fit indices improved significantly, with RMSEA decreasing from 0.092 to 0.067 and CFI increasing from .927 to .980.

The removal of the Autonomy and Relatedness factors suggests that these needs may not be adequately captured by the items in the original WNSS in the context of online platform gig workers. These items did not load well in the EFA, and their removal resulted in a better-fitting model. The factor loadings above .3 for each item, together with their communalities, are illustrated in Table 7.

**Table 7: Factor loadings above .3 and communalities
for the 12-item, three- factor model**

Factor Loadings				
	Factor 1	Factor 2	Factor 3	Communality
WNSS_01	**0.826**			0.78
WNSS_02	**0.857**			0.838
WNSS_03	**0.877**			0.84
WNSS_04	**0.862**			0.853
WNSS_05	0.317		**0.716**	0.67
WNSS_06			**0.819**	0.786
WNSS_07			**0.818**	0.816
WNSS_08		0.332	**0.765**	0.747
WNSS_09		**0.825**	0.332	0.839
WNSS_10		**0.902**		0.917
WNSS_11		**0.795**		0.72
WNSS_12		**0.76**		0.663

Discussion

The results indicate that the original five-factor structure of the WNSS
does not fit well with the data from online platform gig workers. The
modified three-factor model, comprising Survival Needs, Social
Contribution Needs, and Competence Needs, provides a considerable
better fit.

The poor fit of the Autonomy and Relatedness factors may reflect unique
aspects of online gig work that are not adequately addressed by the existing
WNSS items. Gig work is characterized by high levels of autonomy in
terms of work scheduling and task selection, but this autonomy may be
constrained by algorithmic management and platform policies (Shapiro,
2018).

Autonomy Needs in Online Gig Work

The autonomy need is crucial in the online gig work context, where workers often operate with fewer traditional constraints (Carneiro et al., 2023). Unlike classical workers, who may experience more rigid schedules and hierarchical oversight, online workers frequently enjoy increased control over their work environment and schedule (Van Yperen et al., 2014). This heightened level of independence can elevate their need for autonomy, as it enables them to determine when, where, and how they complete tasks. However, this autonomy may also be mitigated by algorithmic management and platform policies, which can constrain genuine decision-making freedom (Shapiro, 2018). Nevertheless, the initial rise in perceived independence and flexibility sets the stage for different expressions of autonomy needs compared to traditional office-based settings.

Relatedness Needs in Online Gig Work

The relatedness need refers to feeling valued and connected to others (Dutta et al., 2021). For classical workers, face-to-face interactions in a shared physical workspace naturally foster stronger interpersonal bonds, thus fulfilling relatedness needs more readily (Van Yperen et al., 2014). In contrast, online gig workers often navigate a more isolated environment, engaging primarily through digital interfaces without the immediate social presence of colleagues or supervisors. This can lead to difficulties in meeting relatedness needs, as the absence of in-person interactions and community can result in feelings of disconnection (Pesole, A. et al., 2018; Van Yperen et al., 2014). Although online workers may feel more competent as independent task managers, this perceived competence does not necessarily translate into social support and meaningful relationships. Adapting the WNSS to better reflect the unique relational dynamics in online work environments could therefore be essential for accurately assessing and improving relatedness satisfaction in the gig economy.

Limitations, implications and future research

The findings suggest that the WNSS may require adaptation to accurately assess need satisfaction among online gig workers. The unique characteristics of gig work, such as algorithmic management and virtual-only interactions, may necessitate the development of new items or scales that better capture autonomy and relatedness in this work context.

Future studies should consider adapting the WNSS to include items that reflect the unique aspects of online platform gig work. For this, qualitative studies might be needed on a more diverse sample of online gig workers from different platforms and regions.

Conclusion

The study reveals that the traditional 20-item, 5-factor structure of the WNSS does not adequately fit the studied online platform gig worker population. The modified three-factor model that we tested, which excludes Autonomy and Relatedness needs, provides a considerable better fit. This suggests that the WNSS may require adaptation to accurately assess the work need satisfaction of online platform gig workers, particularly concerning autonomy and relatedness needs.

Understanding how gig workers experience and satisfy their basic psychological needs is crucial for developing interventions, policies, and platform designs that enhance their well-being and job satisfaction.

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Declaration of conflict of interests

The author declares no conflict of interests.

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