

FRAGILITY OF HAPPINESS SCALE: EVIDENCE OF PSYCHOMETRIC ADEQUACY IN GERMAN

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The concept of happiness encompasses individuals' perceptions and notions regarding its essence and manifestation. This domain has garnered attention in happiness research, with findings indicating its profound impact on individuals' mental health and well-being. To the best of our knowledge, this is the first study in which psychometric properties regarding the German version of the Fragility of Happiness Scale (FrHS) are investigated. The aim of the study was to translate and assess the reliability and validity of the FrHS. The study participants comprised 314 higher education students in Austria. A random sampling was applied. A quantitative study using a positivist paradigm and a deductive approach was used. The overall factor structure of the FrHS was established as a one-factor structure using exploratory and confirmatory factor analysis. Reliability was established with a Cronbach's alpha coefficient of .832 indicating internal consistency, and validity was established by considering construct and concurrent validity. The proposed German version of the FrHS can be used to assess beliefs concerning the fragility of happiness in German-speaking populations. This study, along with previous research, has demonstrated the reliability and validity of the FrHS in 12 languages. Future studies should explore the reliability and validity of this scale in additional languages and diverse cultural contexts.

Keywords: Fragility of happiness; German; Well-being; Translation; Reliability; Validity.

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The word "happiness," having no standard definition in scientific literature, is the layman's term denoting the "experience of having more immediate positive emotion than negative" (Lambert et al., 2022, p. 536). Conceptions of happiness pertain to individuals' beliefs and ideas about what happiness entails and how it is experienced. This area has gained significant attention in happiness research, with studies indicating that these conceptions can influence peoples' mental health and well-being (Wong & Yuen, 2022; Yıldırım & Belen, 2018). This research holds significance as happiness is universally recognized and pursued as a fundamental value (Lomas & VanderWeele, 2023). Significant progress has been made in understanding the factors that influence happiness. A notable example is the World Happiness Report (WHR), which has ranked countries based on self-reported life evaluations since 2012. Consistently, the top 10 countries on this list are predominantly occupied by Nordic nations and other prosperous Western countries. In 2024, the top runners included countries such as Lithuania, Denmark, Iceland, Switzerland, Austria, and the Netherlands (Helliwell et al., 2024). It is noteworthy that Austria has dropped from 10th place in WHR 2021 (Helliwell et al., 2021) to the 14th place in the WHR 2024 (Helliwell et al., 2024). Recent studies have shown a decline in happiness,

mental health, and well-being across the globe, especially for students in higher education institutions (Eloff & Graham, 2020; Emmerton et al., 2024; Graham & Eloff, 2022). Higher education plays a crucial role in well-being, not only by enhancing students' knowledge and skills, but also by promoting their social and emotional development, thereby strengthening the overall well-being of society.

A recently introduced concept in happiness research is the "fragility of happiness," which refers to the belief that happiness is transient and easily lost. This notion has been linked to poorer mental health and well-being (Lambert et al., 2022; Wong & Yuen, 2022). However, the body of research exploring the fragility of happiness remains limited at present. The Fragility of Happiness Scale (FrHS) was introduced by Joshanloo (2013a) and examined extensively by Joshanloo et al. (2015) in that they showed it to be reliable and valid in 14 countries and across eight languages (Chinese, Dutch, English, Japanese, Korean, Persian, Portuguese, and Russian). This scale is getting more attention in the last few years, and has been shown to be reliable and valid across various contexts and cultures (Graham & Eloff, 2022; Janus, 2023; Namatame et al., 2021; Yıldırım & Çelik Tanrıverdi, 2021); however, it is not been shown to be reliable and valid within the German-speaking Austrian population. With Austria dropping from 10th place to 14th place in the WHR, and with studies showing that there is a decline in happiness, mental health, and well-being across the globe, especially for students in higher education institutions, there is a need to conduct research in the Austrian German-speaking context regarding happiness, mental health, and well-being in higher education institutions. Note that, although Joshanloo et al. (2015) found the Dutch translation of the FrHS to be reliable and valid, although Dutch and German belong to the same West Germanic language, they are distinct languages (Roberge, 2020) and, accordingly, the reliability and validity (R&V) of the German-translated FrHS needs to be established. Finally, in this study, the research question is asked: "What is the reliability and validity of the German-translated FrHS in at a higher education level in Austria?"

LITERATURE REVIEW

Cultural differences influence how happiness is perceived across different cultures. For example, Chinese exhibit a more socially-oriented understanding of happiness, emphasizing the impact of others and the fulfillment of social obligations, whereas the United Arab Emirates (UAE) population views happiness through a collectivistic lens, focusing on actions that bring pride to parents and fulfill religious duties, which is in stark contrast to Western societies who exhibit more individualistic perspectives (personal successes and self-indulgences). Furthermore, certain populations, particularly those from Islamic cultures, are skeptical that hedonic happiness can be found in the material world and may harbor apprehensions about happiness, viewing it as a delicate state subject to the whims of fate and divine will (Joshanloo et al., 2015; Lambert et al., 2022). Fear of happiness and perceptions of its fragility are observed within certain segments of Islamic cultures, as evidenced by studies conducted among predominantly Muslim university students in the UAE (Lambert et al., 2019).

Many different scales have been used linking to happiness, mental health, and well-being. Some well-known scales are used in the literature articles considered in this literature review; thus, a quick overview of these is provided before considering findings in the literature based on using scales such as these. It is important to note that when these scales are applied across different cultural contexts, accurate translation of the questionnaires into the relevant languages is crucial. This ensures that the constructs being measured are culturally appropriate and that the responses accurately reflect the participants' beliefs and experiences

(Wedyaswari et al., 2024; Zegarra-López et al., 2024). Without careful translation and adaptation, the validity and reliability of the scales may be compromised, potentially leading to misleading conclusions.

For measuring beliefs about happiness, the fragility of happiness (FrHS; Joshanloo, 2013a; Joshanloo et al., 2015) and the fear of happiness (FeHS; Joshanloo, 2013b; Joshanloo et al., 2014) are two well-known scales. The FrHS is a 4-item scale capturing the belief in the fleetingness of happiness with items such as “Something might happen at any time and we could easily lose our happiness.” The FeHS is a 5-item scale capturing the belief that happiness signals impending unhappiness with items such as “I prefer not to be too joyful, because usually joy is followed by sadness.”

Scales measuring well-being are, for example, the Flourishing Scale (FS; Diener et al., 2009) and the Mental Health Continuum Short Form (MHC-SF; Keyes, 2009). The FS is an 8-item scale measuring social psychological prosperity (e.g., having a sense of meaning, feeling engaged and competent) with items such as “I am optimistic about my future.” The MHC-SF is a 14-item scale measuring social, emotional and psychological well-being with items such as “During the past month, how often did you feel that you liked most parts of your personality?”

All these scales have been used in different contexts throughout the years. The current study’s focus is on establishing the R&V of the FrHS in a student population in a higher education institution in Austria, and, since happiness, mental health, and well-being have been shown to be strongly correlated, the literature review will focus on the happiness, mental health, and well-being of students at higher education level in various contexts. Many studies have shown the economic and social benefits of completing higher education (Chan, 2016; Watson, 2014); thus, exploring the happiness, mental health, and well-being of higher education students is of great importance, as they all contribute to the successful completion of a higher education degree.

Eloff and Graham (2020) utilized the MHC-SF, FS, and FrHS to assess the happiness levels, mental health, and well-being of South African undergraduate students residing in university accommodations at two distinct time points: the beginning ($N = 551$) and end ($N = 281$) of the academic year; they observed a significant decrease in these domains. Analyzing survey data from a cohort of 834 Emirati university students in the UAE, Lambert et al. (2022) utilized measures of fear and fragility of happiness to delineate well-being profiles. Various scales were used (including the FeHS, FrHS, FS, and MHC-SF), and they concluded that a significant relationship exists between beliefs in the fear and fragility of happiness and lower subjective well-being. In the same year, Kabra and Mathur (2022) published the results of their study comprising of 150 university students in India that focused on the relationship between mindfulness (i.e., mental practice that involves paying full attention to the present moment) and happiness (various conceptions of happiness were considered including fragility of happiness). In their regression analysis, it was found that mindfulness emerged as a significant predictor across all the happiness conceptions examined. Moreover, concerning the fragility of happiness specifically, there existed a noteworthy negative correlation between mindfulness and the perception of happiness fragility. This indicates that among university students in India, a decreased focus on the present moment corresponded with an increased tendency to view happiness as fragile and susceptible to loss.

Graham and Eloff (2022) collected data using three scales, the FrHS, MHC-SF, and FS, which were combined into one survey and distributed at a large, urban university in South Africa to determine whether there were significant differences in terms of happiness, mental health, and well-being between students’ responses pre- and during COVID-19. Based on data from 905 students, the results indicated a decline in mental health and well-being during the pandemic in several areas: students felt less capable of contributing to society, experienced fewer supportive and rewarding social relationships, and showed decreased

engagement and interest in daily activities. However, improvements were noted in their perceived ability to manage daily life, their sense of being challenged to grow, and their belief that society was improving. More recently, Dobos et al. (2024) collected survey data from 1,148 university students in Hungary using the FeHS and some other validated scales measuring academic burnout, adaptive and maladaptive perfectionism, loneliness and hopelessness, and found that all these concepts (except adaptive perfectionism which was nonsignificant) were positive predictors of fear of happiness. In Austria, the Student Social Survey, conducted by the Institute for Advanced Studies in Vienna, is done every four years among all students at universities, universities of applied sciences, and teacher training colleges. The survey focuses on student satisfaction and well-being. In 2019, 45,000 Austrian students were asked about their satisfaction based on structural aspects and their academic performance (Institute for Advanced Studies, 2024). The study shows a correlation between structural study ability, academic performance and student satisfaction. Students who rate their study situation as rather problematic (low structural study ability) tend to rate their academic performance worse, are three times more likely to drop out, and are less likely to recommend their studies to others, compared to those who rate their study conditions more positively (Zucha et al., 2020). The topic of well-being is specifically included in the current 2023 Student Survey (Institute for Advanced Studies, 2024). Findings present that most students in Austria rate their general health as good or very good, which compares favourably with other European countries. Nevertheless, a considerable proportion report poor well-being, with financial burdens and social isolation being possible causes. Mental health problems such as depression and anxiety disorders are diagnosed and treated frequently in comparison to other European countries.

From the above discussion, it is clear that happiness, mental health, and well-being has been topics of extensive investigation. This research focuses on fragility of happiness, which revolves around the notion that happiness is transient and vulnerable to shifting into unhappiness quickly and at any time.

METHODOLOGY

Participants

The study was a cross-sectional study where data was collected in early December 2023 at an Austrian higher education institution. The institution is home to 27,583 undergraduate and postgraduate students. With 134 degree programs, it offers a wide range of academic courses, for example, architecture, economics, educational science and teacher education, biology, chemistry, mathematics, physics, geography, sport, philology-cultural studies or technical science. The language of tuition is predominantly German, with a few elective modules offered in English (UIBK, 2024). An official request was made to the Vice Rector for Research to send the questionnaire to all students at the university. The request was approved and the questionnaire was emailed to students in all departments at the university.

A total of 398 responses were obtained, however, 84 were completely empty, leaving 314 responses. Of the 314 respondents, the demographic details are shown in Table 1. The average age was 23.77 years old ($SD = 7.02$). The questionnaire indicated that respondents should indicate their number of semesters, and the mean was 4.26 ($SD = 7.98$).

More than 30 subjects were specified, with teacher education being the main subject field of around a quarter of respondents (25.5%), followed by economics (7.3%) and psychology (7.0%). Subsequently, students of educational science, biology, law, and sociology also responded. There is a low level of participation from other degree programs.

TABLE 1
Demographic details of respondents

Variable	Frequency (%)
Gender	
Male	65 (20.7%)
Female	206 (65.6%)
Diverse	2 (0.6%)
Prefer not to disclose	5 (1.6%)
Missing	36 (11.5%)
Study form	
Bachelor	189 (60.2%)
Masters	69 (22.0%)
Diploma	18 (5.7%)
Missing	38 (12.1%)

Research Design and Approach

An electronic survey was sent out by email using Limesurvey in a quantitative research methodology. A deductive strategy and a positivist paradigm were utilized, which correspond with the quantitative research approach. Deduction starts with a certain hypothesis and examines how the raw data support that hypothesis (Kennedy & Thornberg, 2018). In this study, the research alternative we are trying to “prove” (or rather, “demonstrate”) is that the German-translated FrSH is a reliable and valid scale within an Austrian context. The positivist paradigm is important because, in this case especially, truth or reality is largely defined objectively independent of racial, cultural, political, and religious distinctions. Objective findings are obtained when one uses a quantitative method. Deductive in nature, most quantitative research uses survey and experimental techniques to assess particular hypotheses based on broad principles (Wagemaker, 2020).

Instrument

The survey consisted of four sections: (i) a biographical section, (ii) FrHS, (iii) MHC-SF, and (iv) FS. The initial translation from English to German was done by a Senior scientist in the field of education, who is highly fluent in both German and English. The translated items were then considered within the research team on the basis of educational, psychological, and language expertise. The final items were confirmed. This strategy aligns with the views of Cha et al. (2007, p. 386) who state that there are “no gold standard of translation techniques” because of high variability in research environments, but rather that high attentiveness within research teams is propagated. Although the focus of this study is on the FrHS, including the other scales were instrumental to establish the validity of the FrHs. The FrHS uses a 7-point Likert-scale with four items to measure happiness fragility. Higher scores indicate more fragile happiness beliefs. FrHS

was developed by Joshanloo (2013a) to measure belief in the transience of happiness. The development process included an extensive literature review on the conceptualization of happiness and several iterations of item formulations, which were validated through expert review and pilot studies. Subsequent studies tested the FrHS in different cultural contexts, confirming its reliability and validity as a robust instrument (Joshanloo et al., 2015).

The MHC-SF uses a 6-point Likert-scale and has 14 items with higher values indicating better mental high. The FS uses a 7-point Likert-scale and has eight items, with higher values indicating higher social-psychological prosperity. The MHC-SF (Žemojtel-Piotrowska et al., 2018) and the FS (Esch et al., 2013) have already been shown to be reliable and valid in German contexts; however, the FrHS has not. The R&V of the FrHS have been established in various global settings across many different levels and some of these studies are considered next.

Joshanloo et al. (2015) considered data from 2,721 university students from 15 nations and investigated various aspects of the FrHS. They found that the one-factor model (with four items) fit very well for all nations (Cronbach's alpha ranging from .65 to .80), except India (Cronbach's alpha = .42), and excluded India from further analysis. Using data from 14 nations (Brazil, Hong Kong, Iran, Japan, Korea, Kuwait, Malaysia, Netherlands, New Zealand, Pakistan, Russia, Singapore, Taiwan, United States of America), configural invariance was established, meaning that the concept of "fragility of happiness" (FoH) is best represented by a single factor (with four items) in all 14 nations. They also established metric invariance, meaning that the items are interpreted and responded to similarly by respondents from different nations. Although the authors could establish metric invariance, they failed to establish strict scalar invariance for the FrHS. An example is used here to illustrate what this means: if metric invariance is achieved, we can conclude that if a particular item on the FrHS is interpreted as a strong indicator of the construct in the USA, it is also a strong indicator in, say, New Zealand (NZ). If strict scalar invariance was achieved, it would have meant that respondents from the USA and NZ not only interpreted the strength of each item similarly but also perceived the baseline levels of these items similarly, that is, if a person in the USA and a person in NZ both have the same level of FrH, their scores on each item would be the same, implying no cultural bias in item perception. Having said this, many researchers have argued that achieving strict measurement invariance is unrealistic, especially if the instrument has been translated into different languages (Funder & Gardiner, 2024; Reynolds et al., 2022). Although the authors could not establish full scalar invariance (which, again, is an unrealistic expectation), they established partial scalar invariance, meaning that (in the USA-NZ example), while there are some differences in how specific items on the FrHS are perceived or responded to between the two countries, overall, the measurement of the construct remains sufficiently comparable for meaningful analysis and interpretation across both cultural contexts. Joshanloo et al. (2015) furthermore delved into the convergent validity of the FrHS (but not discriminant validity) by scrutinizing its associations with individual and cultural diversity variables. Their findings revealed notable positive correlations between fragility of happiness and measures such as fear of happiness, fate control, religiosity, and negative affect, alongside significant negative correlations with individualism, human development index, positive affect, and life satisfaction. This evidence strengthened the case for convergent validity. Furthermore, the predictive validity of the FrHS underwent scrutiny as its capacity to predict variations in life satisfaction beyond individual and cultural-level predictors was assessed. The study found that the FrHS contributed significantly to explaining variance in life satisfaction, even after considering individual-level factors like personal growth initiative, negative affect, and positive affect, as well as cultural-level predictors like individualism and human development index.

Although studies have established the reliability of the FrHS in different contexts, such as South Africa (Cronbach's $\alpha = .824$; Eloff & Graham, 2020), the first two major studies following the work by Joshanloo et al. (2015) which conducted comprehensive analyses of the psychometric properties of FrHS using various advanced statistical techniques was by Yıldırım and Çelik Tanrıverdi (2021) and Namatame et al. (2021). Yıldırım and Çelik Tanrıverdi (2021) considered the Turkish adaptation of the FoHS within a university student population ($N = 428$) and found that both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) supported a one-factor structure. Furthermore, they established convergent and discriminant validity by using correlations between the items on the FrHS and those on the FeHS, the Externality of Happiness Scale (EHS; Joshanloo, 2017), and the Riverside Life Satisfaction Scale (RLSS; Margolis et al., 2019). Additionally, the predictive validity was established by examining the predictive power of the FrHS to predict RLSS scores. Namatame et al. (2021) analyzed data of 341 Japanese undergraduates who completed the FrHS and confirmed that the Japanese version had a one-factor structure, good internal consistency, test-retest reliability, and construct validity. Furthermore, incremental validity was established by showing that the FrHS predicted psychological elements (life satisfaction, depression, anxiety, stress) better than the Behavioral Inhibition System (BIS) and the Behavioral Activation System (BAS), respectively.

Using data from 905 South African undergraduate students, Graham and Eloff (2022) established the R&V of all three scales considered in their study, namely, the FrHS, MHC-SF, and FS. For the FrHS, the Cronbach's alpha coefficient equaled .830 thereby establishing reliability and, for validity, construct validity was established by considering convergent and discriminant validity. For the former, items belonging to the FrHS correlated significantly and strongly with each other; and, for the latter, items belonging to the FrHS correlated less strongly with items belonging to the MHC-SF and FS than with items on the FrHS itself. Accordingly, by establishing convergent and discriminant validity, construct validity was established for the FrHS. Janus (2023) established the R&V of the Polish FrHS using data from 351 adults and showed that the FrHS held its factor structure (EFA confirmed the one-factor structure), had good internal consistency (Cronbach's $\alpha = .80$) and good discriminatory power.

Data Analysis

For data analysis, the Statistical Package for the Social Sciences (SPSS) Version 29 was utilized. In the context of demographic variables, missing values remained unreplaced. However, in the case of the FrHS, MHC-SF, and FS, the inferential statistical analyses (EFA, CFA, Cronbach's alpha coefficients, correlations), were performed after replacing the few missing values with multiple imputation (MI). This approach was taken because Van Ginkel et al. (2020) recently demonstrated that MI is the most effective method for handling missing values, irrespective of the type or quantity of missing values.

To explore the underlying construct of the FrHS, EFA and CFA were performed. For the EFA, Promax rotation and Principal Component Analysis extraction was used as Promax rotation allows for factors to be correlated (should there be more than one factor extracted). For the CFA, when interpreting the goodness-of-fit (GoF) indices (such as the chi-square — χ^2 — statistic, goodness of fit index — GFI, adjusted goodness of fit index — AGFI, comparative fit index — CFI, and Tucker-Lewis index — TLI), it is important to note the following. The chi-square statistic was once the most commonly reported index but is now considered overly sensitive to sample size (Ximénez et al., 2022). However, the chi-square value and the corresponding degrees of freedom (df) are still reported to indicate model complexity.

Regarding other GoF measures, recent research advises against relying on conventional cut-off values like $CFI \geq .90$ as they were derived via simulation without taking into account sampling variability (Ximénez et al., 2022) and are considered overly stringent (Xia & Yang, 2019). The latter authors argue that larger GoF values (such as the CFI) and smaller badness-of-fit (BoF) values (such as the root-mean-square error of approximations, RMSEA) indicate better fit, and that dependence on outdated cut-offs should be avoided.

For reliability, Cronbach's alpha is typically used to establish internal consistency, and values above .60 are deemed acceptable (Hair et al., 2019). For validity, correlations were used. Specifically, nonparametric Spearman correlations (r_s) were used as opposed to the well-known Pearson correlation, as the majority of data is ordinal Likert-scale data or nonnormal (Shapiro-Wilk p -value $< .05$) continuous data (where scores were created by averaging over items). When interpreting correlations, there are many different recommendations on how to interpret them. The most common recommendation is to use effect sizes for interpretation. For effect size, $r_s \leq .10$ (weak), $.10 < r_s < .30$ (weak-to-moderate), $r_s = .30$ (moderate), $.30 < r_s < .50$ (moderate-to-strong), and $r_s \geq .50$ (strong) (Téllez et al., 2015). A significant level of 5% was applied to every statistical test.

Instrument Quality Assurance

To establish the R&V of a questionnaire, Cronbach's alpha is typically used for reliability and correlations for construct validity. However, before these R&V tests can be conducted, the underlying factor structure of the theoretical model has to be confirmed using an EFA and a CFA, respectively. The EFA is exploratory in that the German version of the FrHS has not been used before and we need to explore the underlying factor structure within an Austrian context, and the CFA is confirmatory to confirm that the underlying factor structure is one factor for the FrHS in an Austrian context (which would then be similar to what has been found in other contexts).

Instrument Quality Assurance: Exploratory Factor Analysis

For the EFA, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity were considered to investigate whether the data is suitable for dimension reduction (i.e., factor analysis). The KMO value ($= .775$) is above the minimum cut-off value of .5 (Schreiber, 2021), indicating that the data is suitable for factor analysis. The p -value of Bartlett's test of sphericity is statistically significant ($\chi^2(6) = 525.47$, $p < .001$), indicating that sufficient correlations exist among the items to proceed with an EFA (Hair et al., 2019). Next, the communalities were considered (Table 2).

Child (2006) recommends that any item with a communality less than .2 be removed; Holm et al. (2019) recommend the cut-off be .30, with other suggestions of acceptable cut-off values being between .25 and .40 (Eaton et al., 2019). Since the lowest communality is .507, it was decided to keep all items in the EFA based on the communalities. From Table 3, it is evident that the EFA supports a one-factor structure.

From Table 3, it can be seen that one factor was extracted (since one eigenvalue was greater than 1; indicated in bold), and this one factor explains 67.2% of the variance. In summary, the EFA supports a one-factor structure. Next, the CFA is considered.

TABLE 2
Communalities of the EFA

Items	Initial	Extraction
“Something might happen at any time and we could easily lose our happiness” [“Es kann jederzeit etwas passieren, und wir können unser Glück leicht verlieren“]	1.000	.669
“Happiness is fragile” [“Glück ist zerbrechlich“]	1.000	.799
“It is likely that our happiness could be reduced to unhappiness with a simple accident” [“Es ist wahrscheinlich, dass unser Glück durch einen einfachen Unfall in Unglück verwandelt werden kann“]	1.000	.713
“There is only a thin line between happiness and unhappiness” [“Es gibt nur einen schmalen Grat zwischen Glück und Unglück“]	1.000	.507

TABLE 3
Factors extracted

Factor	Initial eigenvalues		
	Total	% of variance	Cumulative %
1	2.688	67.2	67.2
2	0.636	15.9	83.1
3	0.419	10.5	93.6
4	0.257	6.4	100.0

Instrument Quality Assurance: Confirmatory Factor Analysis

A CFA was conducted (chi-square = 9.261, $df = 2$) and the corresponding fit indices for the FrHS are displayed in Table 4.

TABLE 4
Fit indices for the FrHS

Statistic	Recommended values	Obtained values
RMSEA	< .10 (preferably < .08)	.108
GFI	0 (no fit) – 1 (perfect fit)	.985
AGFI		.925
CFI		.986
TLI		.958

Note. RMSEA = root-mean-square error of approximation; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; TLI = Tucker-Lewis index.

Following these recommendations, it can be seen that the GoF indices (GFI, AGFI, CFI, and TLI) are all close to 1 (ranging between .925 and .986), which indicates good fit; however, the BoF index RMSEA is above the preferably conventional cut-off values of .08 and .10, indicating a poor model fit. However, recall that researchers are now cautioning against using these conventional cut-off methods and state that smaller BoF values and larger GoF values indicate better fit. Furthermore, while the RMSEA may appear slightly elevated, Kenny et al. (2015) highlighted its limitations particularly in simpler models with few *df*. Given that the FrHS exhibits a very low *df* (= 2), this caveat should be considered in the interpretation of the RMSEA values. Although Joshanloo et al. (2015) considered measurement invariance, it is not considered in this study. The reason being that, measurement invariance considers whether resulting scale scores can be compared across different populations of interest — frequently, across different countries. As our target population was undergraduate German-speaking Austrian students, comparisons across countries using the German-translated FrHS was not our goal.

Instrument Quality Assurance: Reliability and Validity

For reliability, the Cronbach's alpha coefficient equals .832 (> .6), indicating that internal consistency for the FrHS. For validity, two types of validity were considered, namely, construct and concurrent validity. The former is considered first. Construct validity consists of two aspects, namely, convergent validity and discriminant validity (Cohen et al., 2018). Convergent validity refers to the extent to which items belonging to the same construct correlate strongly, whereas discriminant validity is the degree to which constructs are different from each other, meaning that correlations of items belonging to different constructs should be weaker than the correlation of items belonging to the same construct (Hair et al., 2019). For convergent validity, Table 5 shows that all correlations between items belonging to the FrHS are statistically significant ($p < .05$) and are moderately to strongly correlated, ranging from .379 to .680.

TABLE 5
Correlations between the items of FrHS

	FrHS1	FrHS2	FrHS3
FrHS 2: "Happiness is fragile"	.680*		
FrHS 3: "It is likely that our happiness could be reduced to unhappiness with a simple accident"	.526*	.647*	
FrHS 4: "There is only a thin line between happiness and unhappiness"	.379*	.468*	.496*

* $p < .001$.

For establishing discriminant validity, correlations of items belonging to different scales should be weaker than the correlations of items belonging to the same scale (Hair et al., 2019). The correlation matrix for all items is not presented, as it is a 26×26 matrix (MHC-SF = 14 items, FS = eight items, FrHS = four items), and, physically and visually, can not fit onto one page. However, it was the case that correlations of items belonging to different scales should be weaker than the correlations of items belonging to the same scale, and one example is given here for illustration purposes. The correlation between "MHC-SF13:

Confident to think and express your own ideas and opinions?” and “FrHS3: It is likely that our happiness could be reduced to unhappiness with a simple accident” equals $-.042$ (close to zero) with a p -value equal to $.458$ ($> .05$) indicating that the correlation is not statistically significant.

For concurrent validity, the results of the FrHS were compared to two already existing validated scales, namely, the MHC-SF and the FS, due to the close relation between happiness, mental health, and well-being. It was already mentioned that higher scores of the FrHS indicate more fragile happiness beliefs, higher values on the MHC-SF indicate better mental health, and higher values on the FS indicate higher social-psychological prosperity (which contributed to overall higher well-being). Thus, one would expect the score of the FrHS to be negatively correlated to the scores of the MHC-SF and FS, respectively. The correlation between the FrHS and MHC-SF score equals $-.257$ and is statistically significant ($p < .001$), with the absolute value of the correlation coefficient being greater than $.1$, indicating it is a not a weak correlation. The correlation between FrHS and FS equals $-.267$ and is statistically significant ($p < .001$), with the absolute value of the correlation coefficient being greater than $.1$, indicating it is a not a weak correlation. Thus, the a-priori prediction that the results of the FrHS would be negatively and significantly correlated to those of the MHC-SF and FS has been established, thereby establishing concurrent validity.

DISCUSSION

The FrHS (Joshani, 2013a, 2013b; Joshani et al., 2014, 2015) have addressed a gap in the plethora of well-being and happiness studies, by investigating *conceptions* of happiness (and its fragility). The current study further contributes to the body of literature on the measurement of beliefs about happiness, rather than happiness itself, with specific reference to use in German. The scale has previously been administered and validated across various populations and found to be valid and reliable “to study cultures and individuals, and more importantly, that it has an invariant factor structure whether it is used to assess individuals or cultures” (Joshani et al., 2015, p. 1202). The development of the FrHS followed a methodologically rigorous process, incorporating extensive theoretical and empirical considerations. This solid foundation contributes to the robustness and transferability of the instrument, as demonstrated by this study and previous research (Joshani, 2013a; Joshani et al., 2015).

The German version of the FrHS, proposed in this study, can be used to assess beliefs concerning the fragility of happiness in German-speaking populations. Using exploratory and confirmatory factor analysis, the overall factor structure of the FrHS was established as a one-factor structure. As indicated, reliability was established with a Cronbach’s alpha coefficient of $.832$ indicating internal consistency of the scale, and validity was established by considering construct and concurrent validity.

The brevity of the instrument, and its utility as a valid measure of beliefs about the fragility of happiness, positions the scale as a reliable assessment strategy to track beliefs about happiness over time in German populations. The durability of beliefs about happiness may shift over time, and as such, the scale presented here may provide useful insights longitudinally.

Limitations can be identified in the study. The German translations were done in an Austrian context. Dialectical differences may present across various regions where the German language is used. Nevertheless, the brevity of the items may mediate the impact of dialectical variation to some extent. In addition, a quantitative deductive approach was utilized, which carries the limitation that researchers, when working with a predetermined hypothesis they seek to “prove,” may become less sensitive to participants and the field

under study, potentially overlooking unexpected insights (Kennedy & Thornberg, 2018). To mitigate this limitation, we have maintained an open-minded stance regarding potential results from the data.

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

The current study explored the German-translated FrHS in a higher education student setting in Austria, and found the German version to be reliable and valid. This study contributed to the body of knowledge as the FrHS has only been shown to be reliable and valid in English (Eloff & Graham, 2020; Graham & Eloff, 2022; Joshanloo et al., 2015), Persian, Japanese, Korean, Chinese, Russian, Portuguese, and Dutch (Joshanloo et al., 2015), Turkish (Yıldırım & Çelik Tanrıverdi, 2021), Japanese (Namatame et al., 2021), and Polish (Janus, 2023). Including the current study, the FrHS has been shown to be reliable and valid in 12 languages, and further studies should consider establishing the R&V for this scale in other languages and different cultures.

ETHICAL CONSIDERATIONS

Permission to collect the data was obtained from the Ethics Committee of the Ethics Committee in the Faculty of Education at the University of Pretoria (HUM0180232HS). In addition, consent was obtained from all respondents at the institution where the data was collected, before completing the survey and anonymity was ensured.

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