THE EUROPEAN EDUCATIONAL RESEARCHER
DOI: 10.31757/euer.431

http://www.eu-er.com/

Assessing subjective university success with the Subjective Academic Achievement Scale (SAAS)

Matthias Stadler
Ludwig-Maximilians-University, Germany

Christoph J. Kemper
HSD University of Applied Sciences, Germany

Samuel Greiff
University of Luxembourg, Luxembourg

Abstract: University achievement is a highly relevant educational outcome with implications for students' academic and professional futures. As the majority of students that drop out of university do so due to subjective reasons in contrast to a lack of capability to handle the workload, a measure of subjective university achievement (complementing grade point average) is helpful to enhance educational research on causes, correlates, and consequences of university success. This study aims to introduce a short scale for assessing subjective academic achievement – the SAAS – and provide first results on its psychometric properties. Based on two independent samples of university students, the internal consistency, factorial validity, and construct validity of the SAAS are corroborated, suggesting the measure's administration in educational research on university success and related issues.

Keywords: *GPA; higher education; short scale; university achievement; university success.*

Introduction

University achievement is a highly relevant educational outcome. On a personal level, students' future careers depend on completing their respective university programs. In addition, a university's reputation is linked to their students' achievements, and finally, societies invest large sums into university students' educations that only pay off if the students succeed in their academic efforts. Students' academic achievement is usually measured in terms of grade point average (GPA), representing the mean of marks from courses contributing to the final degree assessment (Richardson et al., 2012). Thus, GPA is the most widely used and studied measure in tertiary education (Bacon & Bean, 2006) and was frequently shown to correlate with variables of interest to educational researchers such as cognitive ability, motivational strategies, or achievement-related personality traits (Richardson et al., 2012).

However, the use of GPA as an indicator of university achievement has several shortcomings. Johnson (2003) and others highlighted grade inflation – very good or excellent grades becoming more and more commonplace – and argued that colleges or universities use different grading approaches to evaluate students. Moreover, GPA as an indicator of university achievement does not encompass an individual's feelings of achievement regarding intrinsic indices, such as perceptions of accomplishments and prospects (Aryee et al., 1994). According to the research literature, these subjective aspects of university achievement seem to play a vital role in university dropout. Only about 30% of students leave university because they cannot handle the workload and receive bad grades (Ulriksen et al., 2010). The majority of students, roughly 70%, leave for subjective reasons. Thus, it seems reasonable to consider

university achievement as a subjective construct (Gattiker & Larwood, 1988). In order to obtain a broader picture of the factors involved in university achievement, it is important to measure subjective achievement in addition to university GPA.

Assessing subjective aspects of achievement has become common practice in organizational research (Abele & Spurk, 2009; Dai & Song, 2016; Dries et al., 2008) but has not yet found its way into educational assessment (Mould & DeLoach, 2017). Thus, to stimulate basic and applied educational research, a psychometrically sound measure for subjective university success is necessary. In the present article, we propose the Subjective Academic Achievement Scale (SAAS) as a measure of subjective ratings of students' academic achievement.

Subjective achievement can be defined as a combination of the internalized achievement evaluations made by significant others and one's own evaluation of achievement, weighted against peers' careers and certain age-related or personal expectations about achievement (Betz & Fitzgerald, 1987; George et al., 2008). The SAAS was constructed in line with this definition and proposed guidelines of short-form development (e.g., see Ziegler et al., 2014). Students must rate their academic achievement relative to their personal goals, invested effort, and peers' achievement. In the present article, we will present the psychometric properties of the German version - internal consistency, factorial validity, and construct validity of the SAAS score based on two samples of university students. Items are depicted in Table 1 (English and French translations are also provided).

Table 1

Items of the SAAS (and tentative English as well as French translations)

Item	German	English	French
1	Ich bin mit meinen Noten im Studium zufrieden.	I am satisfied with my grades at university.	Je suis satisfait de mes notes dans mes études.
2	Ich bin in meinem Studium erfolgreich.	I am successful in my studies.	Je suis succès dans mes études.
3	Meine Noten sind für meinen Arbeitsaufwand angemessen.	My grades are appropriate for my effort.	Mes notes sont appropriés pour ma charge de travail.
4	Ich komme in meinem Studium schnell genug voran.	I progress adequately fast in my studies.	Je serai assez vite dans mes études avant.
5	Meine Mitstudenten studieren erfolgreicher als ich.	My fellow students study more successful than I.	Mes camarades de classe étudient plus succès que je

Note: Only the German version of the SAAS is currently validated. English and French translations are given to instigate future research.

As objective and subjective indicators of achievement are conceptually and empirically related (Ng et al., 2005), GPA and scores on the SAAS should be substantially correlated, supporting convergent validity. Importantly, subjective achievement has to be conceptually distinguished from subjective estimates of cognitive ability, as even subjective

measures of cognitive ability were found to correlate with university GPA (Paulhus et al., 1998) whereas George et al. (2008) found no correlation between intelligence and subjective university success. Thus, the relation between subjective academic achievement measured using the SAAS and cognitive ability is investigated in the current article. Low correlations were expected as an indicator of discriminant validity.

Methods

Participants

We recruited two independent samples of university students at a German university. Sample 1 consisted of 165 students (62.2% female, mean age 22.53 years, SD = 3.83) enrolled in study programs of biology, psychology, or sport sciences. Sample 2 consisted of 305 students studying to become teachers (70.9% female, mean age 23.63 years, SD = 5.08), representing a very heterogeneous sample. In agreement with the university's ethics guidelines, participation in the study was voluntary, and students could receive individual feedback on their test results.

Measures

Subjective Academic Achievement Scale (SAAS):

The SAAS consists of five items, which participants answered on a rating scale ranging from 1 to 5. The value 1 indicated low, and the value 5 indicated high satisfaction with one's academic achievement. Item 5 was worded negatively and thus reversed before scoring. In a pilot study with N = 50 students from various subjects, the internal consistency was good, Cronbach $\alpha = .82$, and students did not encounter any difficulties in understanding the items.

Objective university achievement (GPA):

The grade point average (GPA) participants had achieved by the study time was used as an indicator of objective university achievement. Students were asked for their current GPA, which was later corroborated with the students' office's official data.

Cognitive ability:

As an indicator of students' cognitive ability, the Intelligence Structure Test–Screening (IST Screening; Liepmann et al., 2012) was administered. The IST Screening is a brief cognitive ability test consisting of 60 tasks measuring verbal, numerical, and figural aspects of cognitive ability. The test authors report acceptable to good reliability indices for the three scales ranging from .72 to .90.

Procedure

The order of measures was identical in both samples – IST screening, GPA, SAAS. Due to organizational reasons, measures were administered computerized for Sample 1 and in a traditional paper-pencil form for Sample 2. To collect the students' grades from the university's secretary, their identity was made anonymous by using the student

identification number. After data collection, the documents relating student IDs to personal information were deleted to ensure complete data protection.

Statistical Analysis

We specified the expected relations between the three constructs of objective and subjective university achievement as well as cognitive ability using structural equation modeling (SEM) with robust maximum likelihood estimation (MLR) in Mplus 7.3 (Muthén & Muthén, 2018). To limit the parameters estimated in the structural models, we aggregated the cognitive ability items to three parcels for numerical, verbal, and figural content (Little et al., 2002). Missing values were handled using full information maximum likelihood estimation. The model fit assessment was based on fit indices recommended by Beauducel and Wittmann (2005) and criteria proposed by Hu and Bentler (1999).

Results

Descriptive Statistics

Descriptive statistics, as well as manifest intercorrelations between all variables, are given in Table 2. As can be seen, the means of all variables were similar between the two samples, but there were considerable differences in the standard deviations for the IST score.

Table 2

Descriptive statistics and correlations

Variables	*Mean (SD)*		*SAAS*	*GPA*	*IST*
	Sample 1	*Sample 2*			
SAAS	*16.45(2.95)*	*17.27(2.49)*	-	*.38***	*.40***
GPA	*2.31 (.61)*	*2.17 (.47)*	*.55***	-	*.15**
IST	*47.15(2.95)*	*48.05(5.38)*	*.12*	*.27***	-

Note: SD = Standard Deviation, SAAS = Subjective academic achievement scale, IST = Intelligenz-Struktur-Test, correlations for Sample 1 are given below the diagonal, correlations for Sample 2 are given above. *p<.05, **p<.01.

Internal Consistency and Factorial Validity

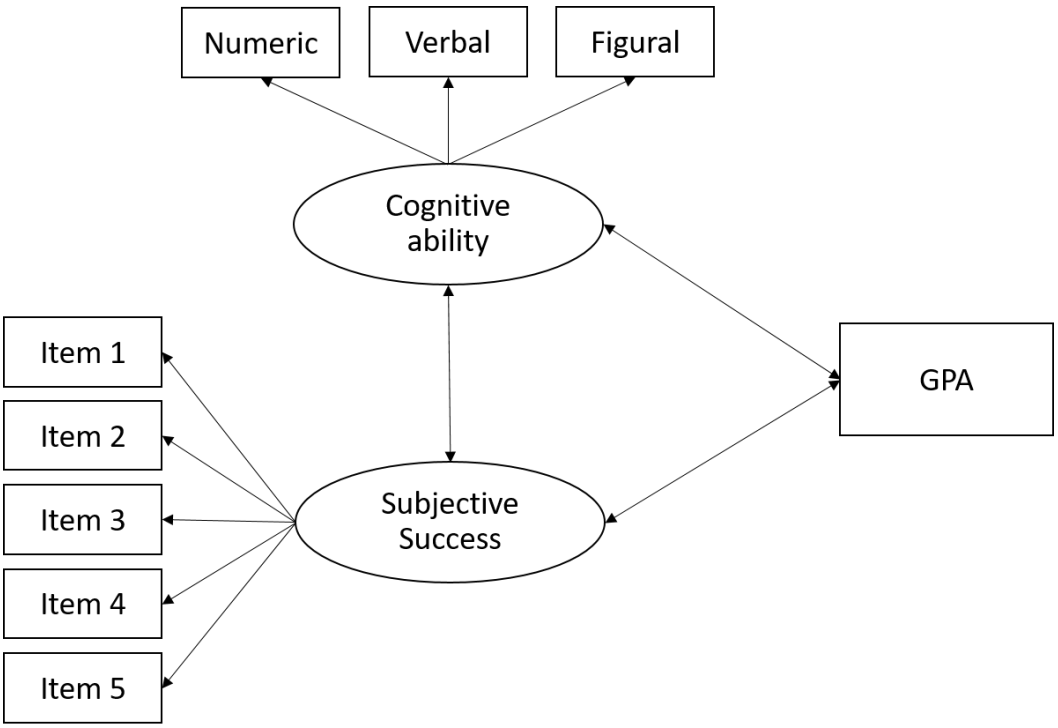
The internal consistency of the SAAS score was good for Sample 1 ($\alpha = .82$) and for Sample 2 ($\alpha = .79$). In both samples, factor loading were substantial ranging from .45 to .90 (Sample 1) and .45 to .84 (Sample 2), respectively. Measurement models yielded a perfect fit to the data both for Sample 1 ($\chi2 = 2.83$; df = 4; p = .290; RMSEA = .00; CFI = 1.00; SRMR = .02) and Sample 2 ($\chi2 = 3.05$; df = 4; p = .270; RMSEA = .00; CFI = 1.00; SRMR = .02).

Construct Validity

To investigate the construct validity of the SAAS, we specified a structural model with correlations between the latent factors of SAAS and cognitive ability and the GPA score. Figure 1 illustrates the model graphically.

Figure 1

Structural equation model correlating subjective success, cognitive ability and grade point average (GPA)



The resulting model showed an acceptable fit to the data for Sample 1 ($\chi 2 = 45.71$; df = 25; $p < .001$; RMSEA = .07; CFI = .94; SRMR = .05) and a good fit for Sample 2 ($\chi 2 = 35.19$; df = 25; $p = .082$; RMSEA = .04; CFI = .96; SRMR = .07). The relations found between the SAAS and GPA scores were in line with our expectations, with a correlation of $r = .57$ ($p < .001$) in Sample 1 and $r = .52$ ($p < .001$) in Sample 2, indicating convergent validity of the SAAS score. Unexpectedly, between the SAAS and IST score, we found a non-significant correlation of $r = .07$ ($p = .263$) for Sample 1 but a significant correlation of $r = .55$ ($p < .001$) for Sample 2. Thus, implications for discriminant validity remain elusive and will be discussed below. Correlations between IST score and GPA were $r = .22$ ($p < .001$) for Sample 1 and $r = .24$ ($p < .001$) for Sample 2 and well within the range of expected values.

Discussions

While studies of predictive factors for success in honors have been increasingly creative and expansive on what these factors might include, they have rarely challenged the dominant, virtually monolithic definitions of success (Mould & DeLoach, 2017). This study aimed to introduce a short scale for assessing subjective academic achievement – the

SAAS – and provide first results on its validity. Based on two independent samples of the targeted population, we found results supporting the internal consistency, factorial validity, and convergent validity of the SAAS. The results align with previous findings on subjective university success in that subjective and objective success seem to be related but distinguishable phenomena (George et al., 2008).

For both samples, we found the measurement models of the SAAS to fit very well to the data. Regarding convergent validity, the strong but far from perfect correlations between SAAS scores and students' GPA demonstrated that SAAS scores reflect an evaluation of students' university achievement-related but not equal to their objective grades. The results were inconsistent with substantial differences between the correlation of SAAS and IST score in the two samples regarding discriminant validity. This variance in results may be caused by a range restriction of the IST score within Sample 1 (see Table 2), resulting in an attenuation of the correlation. Under the assumption of equal variances, the manifest correlation between SAAS and IST scores for Sample 1 rises from r = .12 to r = .21 (Stauffer & Mendoza, 2001). The unexpectedly high correlations found for Sample 2 could be an artifact caused by the high heterogeneity of study programs of teachers as different programs entail different frames of reference for subjective estimations of achievement. Unfortunately, the complex nature of the sample (students enrolled in multiple programs) does not allow including this 2-level structure into our analyses. In summary, our results support using the SAAS as a (complimentary) measure of students' university achievement, especially in research settings (Mould & DeLoach, 2017).

Funding: This research was funded by grants of the Fonds National de la Recherche Luxembourg (ATTRACT "ASKI21 "; AFR "CoPUS").

References

Abele, A. E., & Spurk, D. (2009). How do objective and subjective career success interrelate over time? Journal of Occupational and Organizational Psychology, 82(4), 803–824. https://doi.org/10.1348/096317909X470924

Aryee, S., Chay, Y. W., & Tan, H. H. (1994). An Examination of the Antecedents of Subjective Career Success Among a Managerial Sample in Singapore. Human Relations, 47(5), 487–509. https://doi.org/10.1177/001872679404700502

Bacon, D. R., & Bean, B. (2006). GPA in Research Studies: An Invaluable but Neglected Opportunity. Journal of Marketing Education, 28(1), 35–42. https://doi.org/10.1177/0273475305284638

Beauducel, A [Andre], & Wittmann, W. W. (2005). Simulation Study on Fit Indexes in CFA Based on Data With Slightly Distorted Simple Structure. Structural Equation Modeling: A Multidisciplinary Journal, 12(1), 41–75. https://doi.org/10.1207/s15328007sem1201_3

Betz, N. E., & Fitzgerald, L. F. (1987). The career psychology of women. Academic Press.

Dai, L., & Song, F. (2016). Subjective Career Success: A Literature Review and Prospect. Journal of Human Resource and Sustainability Studies, 04(03), 238–242. https://doi.org/10.4236/jhrss.2016.43026

Dries, N., Pepermans, R., & Carlier, O. (2008). Career success: Constructing a multidimensional model. Journal of Vocational Behavior, 73(2), 254–267. https://doi.org/10.1016/j.jvb.2008.05.005

George, D., Dixon, S., Stansal, E., Gelb, S. L., & Pheri, T. (2008). Time diary and questionnaire assessment of factors associated with academic and personal success among university undergraduates. Journal of American College Health : J of ACH, 56(6), 706–715. https://doi.org/10.3200/JACH.56.6.706-715

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Johnson, V. E. (2003). Grade inflation: A crisis in college education. Springer.

Liepmann, D., Beauducel, A [A.], Brocke, B., & Nettelnstroth, W. (2012). IST-Screening: Intelligenz-Struktur-Test ; Screening ; Manual. Hogrefe.

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To Parcel or Not to Parcel: Exploring the Question, Weighing the Merits. Structural Equation Modeling: A Multidisciplinary Journal, 9(2), 151–173. https://doi.org/10.1207/S15328007SEM0902_1

Mould, T., & DeLoach, S. B. (2017). Moving beyond GPA: Alternative Measures of Success and Predictive Factors in Honors Programs. Journal of the National Collegiate Honors Council, 18(1), 149–168. https://eric.ed.gov/?id=ej1172622

Muthén, B., & Muthén, L. (2018). Mplus. In W. J. van der Linden (Ed.), Chapman & Hall/CRC Statistics in the Social and Behavioral Sciences. Handbook of Item Response Theory (pp. 507–518). CRC Press. https://doi.org/10.1201/9781315117430-28

Ng, T. W. H., Eby, L. T., Sornesen, K. L., & Feldman, D. C. (2005). Predictors of objective and subjective career success: A meta-analysis. Personnel Psychology, 58(2), 367–408. https://doi.org/10.1111/j.1744-6570.2005.00515.x

Paulhus, D. L., Lysy, D. C., & Yik, M. S. M. (1998). Self-report Measures of Intelligence: Are They Useful as Proxy IQ Tests? Journal of Personality, 66(4), 525–554. https://doi.org/10.1111/1467-6494.00023

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. Psychological Bulletin, 138(2), 353–387. https://doi.org/10.1037/a0026838

Stauffer, J. M., & Mendoza, J. L. (2001). The proper sequence for correcting correlation coefficients for range restriction and unreliability. Psychometrika, 66(1), 63–68. https://doi.org/10.1007/BF02295732

Ulriksen, L., Madsen, L. M., & Holmegaard, H. T. (2010). What do we know about explanations for drop out/opt out among young people from STM higher education programmes? Studies in Science Education, 46(2), 209–244. https://doi.org/10.1080/03057267.2010.504549

Ziegler, M., Kemper, C. J., & Kruyen, P. (2014). Short Scales – Five Misunderstandings and Ways to Overcome Them. Journal of Individual Differences, 35(4), 185–189. https://doi.org/10.1027/1614-0001/a000148

Corresponding Author Contact Information:

Author name: Matthias Stadler

Department: Chair of Education and Educational Psychology

Faculty: Faculty of Psychology and Education

University, Country: Ludwig-Maximilians-University, Munich, Germany

Please Cite: Stadler, M., Kemper, C. J., & Greiff, S. (2021). Assessing subjective university success with the Subjective Academic Achievement Scale (SAAS). *The European Educational Researcher, 4*(1), 283-290. https://doi.org/10.31757/euer.431

Received: March 29, 2021 ▪ Accepted: August 27, 2021