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Health-promoting lecturing: development and validation of a measure

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Introduction: Mental health impairments among university students have increased significantly in recent years. Although student mental health has received increasing attention, the role of university lecturers in shaping students' well-being remains largely underexplored. Drawing on insights from occupational leadership research, it is assumed that lecturers play a key role in shaping the demands and resources of their students, which in turn impacts students' health and well-being. Against this background, the present study systematically developed and validated a measure for assessing health-promoting lecturing behavior, referred to as the *Inventory for Health-Promoting Lecturing* (I-HeaL).

Methods: An online survey was conducted with a total sample of 1,715 students from German universities to assess the instrument's psychometric properties. The instrument was first analyzed with an initial subsample (n_1 = 300) and then cross-validated in a second subsample (n_2 = 1,415).

Results: The results indicate good overall psychometric quality, including satisfactory reliability coefficients across the subscales. Confirmatory factor analyses confirmed the proposed higher-order two-factor structure, differentiating between stressor- and resource-oriented lecturer behavior. Substantial correlations between lecturer behavior and various indicators of student health and well-being support the criterion validity of the measure.

Discussion and conclusion: Comprising 15 subscales and 47 items, the developed instrument is a valid and reliable measure that allows for a differentiated assessment of lecturers' behavior relevant to students' health and well-being. In practice, it can serve as a basis for designing teaching and learning environments that foster student health and sustainable well-being in higher education.

KEYWORDS

health, students, lecturers, wellbeing, health promotion, leadership, study conditions

1 Introduction

In recent years, the mental health of university students has received increasing attention. An ever-growing number of students report experiencing psychological strain and elevated stress levels throughout their studies (Gilbert et al., 2023; Iqra, 2024; Pinho et al., 2025). More than two-thirds of German students report feeling exhausted due to stress (Techniker Krankenkasse, 2023), which constitutes a core symptom of burnout (Tavella et al., 2021).

Approximately 22% of students were affected by at least one mental disorder in 2023, with the most common diagnoses falling into the categories of depression, anxiety disorders, and adjustment disorders (Techniker Krankenkasse, 2023). Notably, depression and anxiety disorders are more prevalent among students compared to their non-student peers of the same age. Although students are generally considered a healthy population group due to their age and socioeconomic status, these findings indicate a considerable need for action to promote their mental well-being (Grützmacher et al., 2018; Techniker Krankenkasse, 2023).

Several theory-driven studies have examined the conditions underlying stress experiences and mental health among university students (e.g., Awais et al., 2024; Kim et al., 2021). The Job Demands-Resources (JD-R; Bakker and Demerouti, 2007) model has been applied to the context of higher education. In this context, the Study Demands-Resources (SD-R) model provides a theoretical framework for understanding how various study-related demands (factors that consume energy that may lead to stress, e.g., time constraints) and resources (factors that foster motivation and well-being, e.g., social support) contribute to students' levels of burnout, engagement, and academic performance (Bakker and Mostert, 2024). In their review, Bakker and Mostert (2024) suggest that future research could further develop the SD-R theory by exploring new avenues, particularly the potential impact of lecturer behavior on student outcomes. To date, the role of university lecturers in this context has remained largely unexplored. A few exceptions include studies investigating perceived social support from teaching staff and its association with student well-being (Herr et al., 2024; Lehnchen et al., 2025; Lesener et al., 2022). While the availability of social support is considered an important protective factor for maintaining psychological functioning (Vicary et al., 2024; Wickramaratne et al., 2022), qualitative findings suggest that health-promoting lecturer behavior is more complex and multifaceted, extending beyond the mere presence of support (Eloff et al., 2023; Pigeon, 2020). This includes practices such as balanced workload design and the creation of a psychologically safe and healthy learning environment, which illustrate the broader scope of health-promoting behavior beyond traditional notions of support.

Drawing on occupational leadership research, it is well established that leaders can significantly influence employee health, particularly by shaping work conditions (Raghu and Linus, 2024; Vincent-Höper et al., 2017; Vincent-Höper and Stein, 2019). In line with these findings, lecturers are conceptualized in the present study as co-creators of academic conditions (Balwant, 2016), who exert influence on student health through the specific demands and resources embedded in the learning environment (Eloff et al., 2023). Until now, there has been a lack of systematic approaches that explain how university lecturers influence students' health and well-being (Bakker and Mostert, 2024; Herr et al., 2024; Vicary et al., 2024). Previous research has primarily focused on isolated aspects such as social support (Vicary et al., 2024), yet comprehensive instruments that systematically capture the broader impact of lecturer behavior on students' health and well-being remain scarce. To address this research gap, the present study introduces a theory-based framework for a systematic assessment of health-promoting lecturer behavior. Accordingly, the aim was to develop an instrument enabling the reliable and valid measurement of such behavior.

2 Theoretical background

2.1 Leadership and employee well-being

Given the structural and functional similarities between workplace and university settings, such as hierarchical relationships, performance expectations, and stress exposure (Beerkens and van der Hoek, 2022), we adapt the leadership framework to the academic context. In the occupational context, leadership is recognized as a key factor influencing employee health. Several meta-analyses and systematic reviews have shown significant associations between leadership and employee well-being, stress experiences, burnout, and affective symptoms (e.g., Da Silva et al., 2022; Inceoglu et al., 2018; Montano et al., 2023). One instrument specifically developed to assess leadership in relation to employees' mental health is the Health- and Development-Promoting Leadership Behavior Questionnaire (HDLBQ; Vincent-Höper and Stein, 2019). This tool has been shown to predict employees' mental health more accurately than other established leadership models, such as transformational leadership (Vincent-Höper et al., 2017; Vincent-Höper and Stein, 2019). The measure is based on the premise that leaders influence employee health primarily by shaping work tasks and work conditions (Vincent, 2011; Vincent-Höper and Stein, 2019).

Transferring these concepts to the university context, lecturers can be understood as academic leaders who shape the learning environment through their teaching style, feedback practices, and interpersonal behavior. For instance, by providing autonomy-supportive learning conditions, clear communication, and constructive feedback, lecturers can enhance students' perceived control and motivation – factors known to protect against stress and burnout (Ma et al., 2025). Conversely, disorganized course structures or inconsistent expectations may act as stressors that undermine well-being. Thus, the same health-promoting mechanisms identified in occupational leadership – such as fostering resources and reducing unnecessary demands – can be observed in lecturer behavior toward students (Bakker and Mostert, 2024).

This theoretical foundation is therefore directly relevant to the aim of the present study, which seeks to validate a measure of health-promoting lecturer behavior grounded in established leadership theory and adapted to the specific dynamics of the higher education setting.

2.2 Conceptualization of health-promoting lecturer behavior

2.2.1 Defining mental health and well-being

According to the World Health Organization (WHO), mental health is not merely defined by the absence of illness, but also includes positive aspects such as well-being and life satisfaction (World Health Organization, 1948). Expanding on this understanding, Ducki and Greiner (1992) emphasize a developmental component of health, highlighting the importance of acquiring knowledge and building competencies. Building on this definition, the present study seeks to identify and measure lecturer behavior that supports not only students' mental health but also their personal growth and development.

2.2.2 The study demands-resources framework

In the context of higher education, study conditions can be categorized into demands and resources based on the JD-R and on the further development of the SD-R model (Bakker and Demerouti, 2007; Bakker and Mostert, 2024). Study demands encompass physical, psychological, social, and organizational aspects that require effort, such as time pressure, high workload, and complexity (Bakker and Demerouti, 2007; Demerouti and Nachreiner, 2019; Gusy et al., 2016). While demands are not inherently negative, they become stressors when they exceed individual coping capabilities (Bakker and Demerouti, 2007).

Study resources refer to factors that help students cope with demands, achieve academic goals, and promote personal development, including autonomy, participation, and social support (Awais et al., 2024; Bakker and Demerouti, 2007; Demerouti and Nachreiner, 2019; Gusy et al., 2016). The JD-R, respectively, SD-R model suggests that high demands combined with limited resources are linked to lower well-being and poorer health (Bakker et al., 2023; Bakker and Mostert, 2024). This relationship has been empirically confirmed in studies involving university students, showing that high academic demands (e.g., time pressure, workload) paired with insufficient resources (e.g., lack of autonomy or social support) are associated with increased stress, burnout symptoms, and reduced well-being (Awais et al., 2024; Lesener et al., 2020).

2.2.3 Health-impairing effects of study demands

Research indicates that high demands, such as time pressure and cognitive overload, are significant predictors of stress and reduced study satisfaction (Lehnchen et al., 2025; Sieverding et al., 2013). In particular, cognitive demands, such as complexity and quantitative overload, correlate with lower well-being, increased burnout risk, and higher symptoms of anxiety and depression (Gusy et al., 2016; Lesener et al., 2020). Interestingly, Sieverding et al. (2013) and Gusy et al. (2010) suggest that the total study workload (e.g., weekly study hours) appears to be less relevant to stress experiences. This indicates that structural study conditions, such as course design, clarity, and organization, play a more critical role in stress than the mere amount of time spent studying (Lehnchen et al., 2025; Schmidt et al., 2019).

In addition, destructive behavior from lecturers, such as hostility or condescension, can lead to increased stress and negative emotions in students (Balwant, 2016; Herr et al., 2024). In the workplace context, destructive leadership behavior is associated with lower job satisfaction, diminished perceptions of fairness, and increased experiences of stress and negative affect among employees (Mackey et al., 2021; Schyns and Schilling, 2013). Similarly, students who reported that their lecturers behaved in a hostile, condescending, or negligent manner also reported heightened anxiety, depressive symptoms, and greater dissatisfaction (Balwant, 2016).

2.2.4 Health-promoting effects of study resources

Conversely, students with sufficient resources, such as time flexibility and autonomy, report higher satisfaction and resilience. Furthermore, they experience better well-being and fewer depressive symptoms (Awais et al., 2024; Cotton et al., 2002; Wörfel et al., 2016). Time flexibility allows for managing tasks such as preparation and review of coursework and exams, while autonomy reflects the degree of control students have over their study structure (Grützmacher et al., 2018). This freedom also supports the development of intrinsic interests, important for both academic success and personal growth (Holm-Hadulla et al., 2009).

Additionally, studies highlight the importance of participation, social support, and perceived qualification potential as critical resources. The perceived meaningfulness of academic content enhances student engagement and well-being (Gusy et al., 2010; Lesener et al., 2020). Autonomy, task variety, and feedback are also associated with lower burnout and higher academic engagement (Luruli et al., 2020; Mokgele and Rothmann, 2014). Social support from lecturers is particularly significant for student well-being (Herr et al., 2024; Lehnchen et al., 2025; Vicary et al., 2024). This support includes both practical assistance and emotional guidance (Eloff et al., 2023; Kienle et al., 2006). High social support perceived from students and provided by lecturers and university-based services has been shown to reduce stress and improve psychological well-being in students (Basson and Rothmann, 2019; Vicary et al., 2024). Students who feel well-supported report higher efficiency, less meaninglessness, and greater motivation, leading to higher satisfaction (Gumz et al., 2013; Luruli et al., 2020; Mokgele and Rothmann, 2014).

2.2.5 Mechanisms linking lecturer behavior and student health and well-being

In line with the JD-R and the SD-R model, two mechanisms can be identified through which lecturers' behavior influences students' health. On one hand, lecturers can demonstrate resource-oriented behavior by enhancing study-related resources (i.e., health-promoting process). On the other hand, they may engage in stressor-oriented behavior by increasing or buffering study-related stressors (i.e., health-impairing process; Bakker and Demerouti, 2007; Bakker and Mostert, 2024). The notion that lecturers play a role in shaping study demands and resources, as well as influencing student well-being, is reinforced by the latest review by Bakker and Mostert (2024). Consistent with the Conversation of Resources (COR) theory of Hobfoll (1989), the focus of health-promoting lecturer behavior lies in the enhancement of resources. Resources act as a protective factor against stressors, enabling students to cope with demands, achieve their goals, and recover from stressful experiences (Hobfoll et al., 2018). This becomes especially important when structural conditions in the academic environment are only partially controllable (e.g., formats or number of exams), underscoring the significant role that resources play in maintaining students' well-being (Gusy et al., 2016). These two mechanisms are illustrated in Figure 1.

Building on the theoretical background outlined above, this paper examines how lecturers can promote student health and well-being by developing and validating a questionnaire that captures lecturer behaviors. The resulting instrument, the *Inventory for Health-promoting Lecturing* (I-HeaL), is intended to assess a broad range of behaviors associated with either health-promoting or health-impairing aspects of lecturing.

The conceptual foundation of the I-HeaL is based on the SD-R model (Bakker et al., 2023; Bakker and Demerouti, 2007; Bakker and Mostert, 2024), which posits that well-being is influenced by the balance between demands and resources. In line with this framework, the I-HeaL is expected to reflect two overarching dimensions of lecturer behavior: one capturing resource-related behaviors (e.g., emotional or instrumental support) and one capturing stressor-related behaviors (e.g., quantitative or qualitative overload). According to the

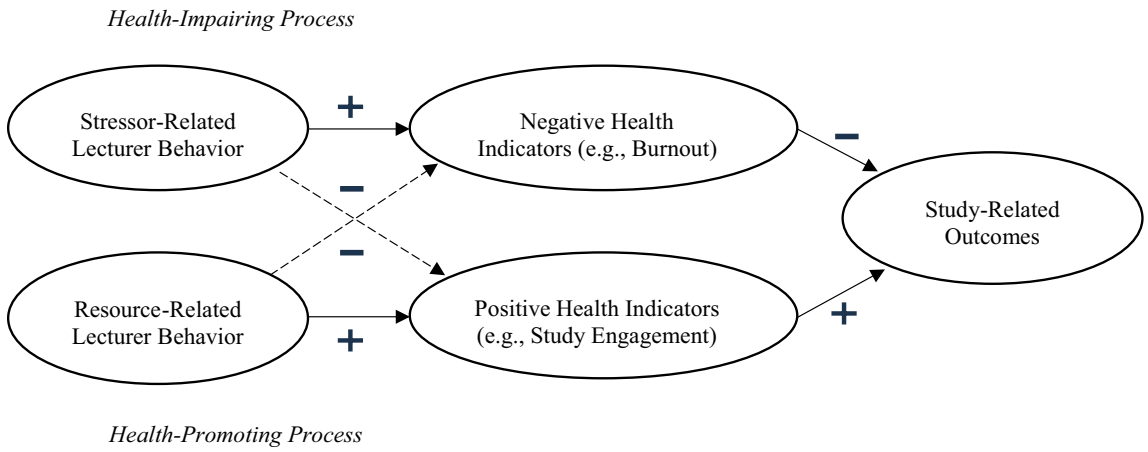

FIGURE 1
The lecturer's role within the study demands-resources framework.

SD-R model, these dimensions are theoretically assumed to relate differently to student health outcomes.

Because academic leadership behaviors are assumed to play a crucial role in shaping students' well-being and stress experiences, various health-related indicators were selected as dependent variables. These indicators reflect key dimensions of students' psychological and physical functioning, encompassing both positive (i.e., study satisfaction, study engagement, study-related self-efficacy, and subjective health) and negative indicators (i.e., burnout, irritation, and psychosomatic complaints). Examining the associations between the I-HeaL subscales and these indicators enables us to assess whether perceived academic leadership contributes to students' health and resilience. This approach also serves to evaluate the criterion validity of the instrument. In line with theoretical assumptions and previous findings, the following hypotheses are proposed:

> *H1a*: *Resource-related subscales are positively associated with positive health indicators.*
>
> *H1b*: *Resource-related subscales are negatively associated with negative health indicators.*
>
> *H2a*: *Stressor-related subscales are negatively associated with positive health indicators.*
>
> *H2b*: *Stressor-related subscales are positively associated with negative health indicators.*

3 Method

3.1 Participants and procedure

A nationwide quantitative online survey was conducted using a cross-sectional design. Respondents were recruited through 700 student councils and 150 university-affiliated offices, such as career centers and student advisory services, which distributed the survey. The link to the study was accessed a total of 2,865 times. The study's inclusion criteria were met by 2,665 individuals, who subsequently consented to participate in the study and to the stipulated terms and conditions. Of these participants, 1,724 individuals fully completed the questionnaire, representing 64.7% of usable data. Following the adjustment of the data for invalid or inferior response patterns (i.e., speeders and straightliners; Curran, 2016; Desimone et al., 2015; Huang et al., 2012; Meade and Craig, 2012), the final total sample size of the survey was $N = 1{,}715$. The sample included students from all over Germany. Lower Saxony was the state that was the most represented (21.4%), while Saarland was the least represented state (0.1%). Please find the detailed distribution of the sample by German state in Supplementary material A. 71.3% of the participants identified as female, 27.8% as male, and 0.9% as diverse. The mean age was 24.0 years ($SD = 4.45$), ranging from 18 to 56 years. Most participants were enrolled in bachelor's programs (71.0%), followed by master's programs (19.8%) and state examination preparation (7.9%). The largest groups studied social sciences (17.7%) and natural sciences (16.7%), while the smallest groups were in art and design (3.1%) and agricultural sciences (0.9%). A detailed breakdown of all disciplinary study groups is provided in Supplementary material B. Most respondents were full-time students (93.7%), with the majority attending state universities (54.5%) compared to 10.5% attending private universities and 0.5% attending other institutions. The average participant was in their fourth semester ($M = 4.31$, $SD = 2.37$).

3.2 Item generation and review

The development of the questionnaire combined both deductive and inductive approaches. Deductively, an extensive literature review was conducted to identify health-related aspects of study and work conditions that lecturers may influence. This process was guided by established models and instruments from stress and leadership research, particularly the HDLBQ (Vincent-Höper and Stein, 2019; Vincent, 2011), which served as a conceptual template for the I-HeaL.

Inductively, qualitative data were collected to ensure content validity and practical relevance. Six semi-structured interviews were conducted with students from various universities and disciplines,

complemented by a focus group discussion with 10 students of work and organizational psychology (Bachelor's and Master's level). Following the Critical Incident Technique (Flanagan, 1954), students were asked to describe specific situations and behaviors in which lecturers had a particularly supportive, stressful, or challenging impact on their well-being. They also shared which behaviors they considered desirable and what conditions would help them better cope with academic demands. The responses were thematically clustered and compared with the theoretically derived dimensions, revealing a high degree of overlap and supporting the relevance of the identified areas.

Based on this process, the initial item pool consisted of 129 items, focusing on observable behaviors. A five-point Likert scale was used for response clarity (1 = *not at all* to 5 = *completely*). To further ensure content validity and reduce the item pool, a structured, multi-step review process was implemented. Six experts with backgrounds in occupational health psychology, leadership research, and higher education were involved in an iterative review process. These experts included university faculty and applied researchers. Each item was evaluated for clarity, relevance, and theoretical alignment. Items were discussed in joint sessions and removed if considered ambiguous, redundant, or misaligned with the intended constructs, resulting in a pool of 62 items.

In a final step, a qualitative pre-test was conducted with 10 advanced psychology master's students with prior experience in diagnostic and mental health. These students, from various universities, rated the items regarding their relevance to mental health, clarity, and scale assignment. Items and scales were presented separately to allow for independent matching. This procedure resulted in a refined item set providing strong qualitative evidence for content validity based on expert ratings. Additionally, the average Content Validity Index (CVI) across all items was 0.93 for relevance and 0.94 for clarity, which, according to Polit et al. (2007), indicates excellent content validity.

This process reduced the pool to 50 items across 16 subscales and resulted in the pre-version of the I-HeaL, capturing health-relevant behavior. The remaining subdimensions largely corresponded to those of the HDLBQ. Compared in detail, the scales Scope of Action, Monotony, Appropriateness, Information, Clarity, Conflict Management, Integrity, and Career Support were excluded, while the subdimensions Destructive Behavior, Inspiration, Meaningfulness, and Emotional Support were added to the pre-version of the I-HeaL. An overview of the pre-version of the I-HeaL with the related subscales is provided in Table 1. The items referred to the lecturer with whom the students had the most contact or who was particularly relevant to their studies.

3.3 Measurements

The survey included scales measuring health-promoting lecturing, indicators of health and well-being, and socio-demographic items. In addition to the I-HeaL items described in Table 1, the questionnaire incorporated validated instruments to measure relevant outcome variables for testing criterion validity. These included indicators of positive health (e.g., study satisfaction, engagement, self-efficacy, and subjective health) and negative health (e.g., burnout, irritation, and psychosomatic complaints). All scales were selected based on theoretical relevance to the SD-R framework (Bakker and Mostert, 2024) and prior empirical use in academic settings (e.g., Schaufeli et

TABLE 1 Subscales and items of the I-HeaL (pre-version).

Subscale	No. items	Example item
Resource-oriented lecturer behavior		My lecturer...
1. Transparency	4	…clearly explains the course objectives.
2. Participation	4	…takes students' ideas and suggestions into account.
3. Justice	5	…evaluates my work in a fair and equitable manner.
4. Confidence in Students' Abilities	3	…shows confidence in my abilities and actions.
5. Meaningfulness	2	…explains the purpose and relevance of the topics covered.
6. Recognition	3	…acknowledges the students' engagement.
7. Instrumental Support	3	…takes the time to clarify questions.
8. Feedback	3	…gives me helpful and constructive feedback on my performance.
9. Care	3	…shows genuine interest in my well-being.
10. Emotional Support	3	…is approachable and listens to students' concerns.
11. Cooperation	2	…encourages students to support each other.
12. Inspiration	2	…inspires me to engage with the topic and content of the course.
13. Complexity/ Variability	2	…sets requirements that demand the use of a variety of skills and abilities.
Demand-related lecturer behavior		
14. Quantitative Overload	3	…often sets demands that overwhelm me in terms of time commitment.
15. Qualitative Overload	4	…often sets demands that overwhelm me in terms of content.
16. Destructive Behavior	4	…embarrasses me in front of others.
	50 (Total)	

TABLE 2 Overview of measures used in the study.

Construct	Instrument	No. items	Example	Response format	Cronbach's α/r_{it}
Health-promoting lecturer behavior	*Inventory for Health-promoting Lecturing* (I-HeaL)	50	"My lecturer shows genuine interest in my well-being."	1 (*not at all*) to 5 (*completely*)	0.67 to 0.88
Subjective health	*Copenhagen Psychosocial Questionnaire* (COPSOQ; Nübling et al., 2005)	1	"How would you rate your current state of health?"	0 (*worst*) to 10 (*best*)	—
Study engagement	*Utrecht Work Engagement Scale - Student Form* (UWES-SF; Gusy et al., 2019)	3	"I feel strong and full of energy when working on my studies."	1 (*never*) to 7 (*always*)	0.82
Study-related self-efficacy	*Short Version of the Occupational Self-Efficacy Scale* (Rigotti et al., 2008)	5	"I am relaxed about difficulties in my studies because I can rely on my abilities."	1 (*not true at all*) to 6 (*completely true*)	0.85
Study satisfaction	*Kunin Scale* (Kunin, 1998) and *General Life Satisfaction Short Scale* (L-1; Beierlein et al., 2014)	1	"How satisfied are you overall with your studies?"	1 (*very satisfied*) to 5 (*very unsatisfied*)	—
Irritation	*Irritation Scale* (Mohr et al., 2005)	8	"I react irritably even though I do not want to."	1 (*applies completely*) to 7 (*does not apply at all*)	0.87
Psychosomatic complaints	Items selected by relevance of the *Psychosomatic Complaints Questionnaire in a non-clinical context* (Mohr and Müller, 2004)	7 (out of originally 20)	"Do you tire easily?"	1 (*never*) to 5 (*almost every day*)	0.80
Burnout	Selected items of the *Short Version of the Maslach Burnout Inventory – Student Survey* (MBI-SS; Wörfel et al., 2015)	6 (out of originally 9)	"I feel drained by my studies."	1 (*never*) to 7 (*always/daily*)	0.86

al., 2002). Table 2 provides an overview of all measures used in the survey, including item examples, response formats, and reliability coefficients. These instruments were used to examine the associations between lecturer behaviors (as measured by the I-HeaL) and student health outcomes, thereby contributing to the validation of the new instrument.

3.4 Statistical analyses

3.4.1 Sampling strategy and cross-validation

To minimize sample-dependent bias, analyses were performed using two independent subsamples. A random subsample ($n_1 = 300$) was first drawn from the total dataset ($N = 1{,}715$) for item and scale analyses as well as for the first-order confirmatory analysis (CFA). The first-order CFA tested whether the items, derived from theoretical and qualitative foundations, propose the 16-factor structure of the I-HeaL. Second-order CFA and criterion validation were conducted on a second subsample ($n_2 = 1{,}415$). The second-order CFA allows testing whether the 16 subscales can be meaningfully summarized into two latent higher-order constructs–namely, resource-related and stressor-related lecturer behaviors–thereby providing evidence for the theoretical assumption of a broader resource–stressor structure underlying the I-HeaL. A comparison of the two groups using *t*-tests and χ^2-tests revealed no significant differences in demographic characteristics. This indicates that the two subsamples can be considered equivalent with respect to their demographic characteristics.

3.4.2 Item and reliability analyses

For the initial psychometric evaluation of the instrument, item analyses were conducted on the first subsample ($n_1 = 300$). This included the calculation of means, standard deviations, skewness, kurtosis, item difficulty, item discrimination, and response distributions. Reliability was assessed using Cronbach's alpha for each subscale and item discrimination (r_{it}). According to Moosbrugger and Kelava (2020), values above 0.70 were considered acceptable, while those above 0.80 were regarded as good. Items that were characterized by extreme item-difficulty (i.e., $80\% < M_{\text{item}} > 20\%$) or by item discrimination below 0.50 were designated as critical. For subscales with only two items, inter-item correlations were calculated.

3.4.3 Factorial structure

As stated above, the instrument's theoretical foundation is robust, having been developed deductively from established models and inductively from qualitative data. In accordance with the recommendations for theory-driven instrument validation, a confirmatory approach was employed to directly test the hypothesized structure instead of a preliminary exploratory analysis (Akbar et al., 2023; Ventura-León et al., 2022).

To empirically examine the construct validity of the proposed structure, CFA was conducted using R (version 4.0.2) and the *lavaan* package (Rosseel, 2012), applying the robust maximum likelihood estimator. Initially, the first-order CFA was performed on the first subsample ($n_1 = 300$). Model fit was evaluated using several global fit indices: χ^2-test, the ratio of χ^2 to degrees of freedom (target ≤ 2.5), Root Mean Square Error of Approximation (RMSEA ≤ 0.08),

Comparative Fit Index (CFI ≥ 0.95), and Standardized Root Mean Square Residual (SRMR ≤ 0.11) (Backhaus et al., 2015; Moosbrugger and Kelava, 2020). Local model fit was assessed by factor loadings, indicator reliability ($R^2 \geq 0.40$), and inter-factor correlations, with very high correlations ($r > 0.90$) considered critically, yet interpreted within the theoretical framework.

Subsequently, the second-order CFA was conducted on the second, larger subsample ($n_2 = 1{,}415$) to test whether the first-order factors could be grouped into higher-order dimensions. To evaluate the factorial structure of the I-HeaL, two second-order confirmatory factor models were evaluated against each other. Model 1 (M1) represents a second-order one-factor structure, in which all 15 first-order factors, corresponding to the individual I-HeaL scales, load onto a single overarching latent factor of health-promoting lecturing behavior. This model assumes a unidimensional conceptualization of the construct.

Model 2 (M2), the target model, posits a second-order two-factor structure. The 15 first-order factors are grouped into two distinct higher-order dimensions: resource-related behaviors (e.g., support, justice) and stressor-related behaviors (e.g., overload, destructive behavior). This structure is theoretically grounded in the SD-R Model, which differentiates between demands and resources as overarching dimensions of health-promoting and health-impairing lecturer behavior (Bakker and Mostert, 2024).

3.4.4 Criterion validity

Criterion validity was tested by calculating Pearson's correlations between subscale scores and seven health-related outcome variables: subjective health, study satisfaction, study-related self-efficacy, study engagement, burnout, irritation, and psychosomatic complaints. Prior to analysis, assumptions for Pearson's correlation (i.e., normality, linearity, and absence of extreme outliers) were tested using visual inspections of histograms and Q-Q plots, as well as Shapiro–Wilk tests. All variables met the criteria for parametric testing.

4 Results

4.1 Item and reliability analyses

Item means ranged from 1.29 to 4.10, indicating that the items vary in how frequently they are endorsed. The wide range of item means suggests that the items capture different levels of the underlying construct and differentiate well between participants. Regarding the reliability of the I-HeaL subscales, 15 out of 16 subscales showed satisfactory to good internal consistency with Cronbach's alpha ranging from 0.67 to 0.88. Discrimination coefficients were high ($r_{it} > 0.52$) for 94% of the items. However, the Complexity subscale with two items showed poor internal consistency ($\alpha = 0.20$) and low discrimination ($r_{it} = 0.20$). Additionally, one item of the Participation subscale exhibited only moderate discrimination ($r_{it} = 0.34$). Consequently, this item and both items of the Complexity subscale were removed from the I-HeaL, resulting in a modified model with 15 subscales and 47 items. The final version of the I-HeaL is provided in Supplementary material C.

4.2 Verification of the factorial structure

The first-order CFA of the revised model analyzed using the first subsample ($n_1 = 300$) indicated a good global model fit ($\chi^2/df = 1.64$, RMSEA = 0.048, SRMR = 0.050, CFI = 0.93). Factor loadings were positive and significant ($p \leq 0.006$) for 96% of the items, with high factor loadings ($\lambda > 0.50$). Correlations between stressor- and resource-related subscales were negative. Thus, the proposed scale structure is supported by the empirical data.

The second-order CFA model comparison between M2 with two factors and M1 with one factor using the second subsample ($n_2 = 1{,}415$) revealed a significantly better fit for M2, supporting the assumption that stressor- and resource-related behaviors of instructors are constituted by two distinct factors. However, M2 showed only a marginally acceptable fit, suggesting the proposed structure is plausible but warrants further evaluation. The results of the second-order CFA models are presented in Table 3.

4.3 Criterion validity

Table 4 displays the correlations of the I-Heal and health indicators, as well as *M*, *SD*, and reliability of the revised model in the second subsample ($n_2 = 1{,}415$). As hypothesized, the resource-related subscales showed significant positive correlations with positive health indicators and significant negative correlations with negative indicators. Conversely, the stressor-related subscales were negatively correlated with positive health indicators and positively correlated with negative indicators. Overall, correlations between the I-HeaL and health-related outcomes ranged from low to moderate in strength. The strongest associations for resource-related teaching behavior were found with study satisfaction ($r = 0.47$) and study engagement ($r = 0.40$). For stressor-related behavior, the highest correlations emerged with study satisfaction ($r = -0.43$) and burnout ($r = 0.43$). In summary, hypotheses H1 and H2 have been supported by the findings.

TABLE 3 Comparison of the model fit indices.

Model	χ^2	*df*	χ^2/df	$\Delta\chi^2$	Δdf	CFI	RMSEA	SRMR	AIC
M2	4306.25	1,018	4.23	1.39	2	0.909	0.051	0.066	164999.89
M1	4824.28	1,019	4.73	518.03*	1	0.895	0.055	0.060	165596.12

$N = 1{,}415$. M1 = Second-order one-factor model with 15 first-order factors representing the scales of the I-HeaL loading onto one higher-order factor (i.e., health-promoting lecturing); M2 = Second-order two-factor model (target model) with 15 first-order factors grouped into two higher-order factors: resource-related and stressor-related lecturer behaviors. CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual, AIC = Akaike Information Criterion. The χ^2-test is significant for all models with $^*p < .001$.

TABLE 4 Correlations of the I-HeaL and health indicators.

Subscale	*M*	*SD*	Cronbach's α/r_{it}	Health Indicators						
				Positive				Negative		
				SS	SH	SE	SSE	IR	PC	BU
Resource-oriented lecturer behavior	3.48	0.76	.96	.47	.24	.40	.33	−.25	−.19	−.38
Transparency	3.40	0.90	.80	.35	.21	.32	.30	−.24	−.18	−.31
Participation	3.29	0.97	.76	.37	.18	.30	.27	−.20	−.15	−.27
Justice	3.96	0.79	.83	.37	.20	.27	.24	−.23	−.17	−.31
Confidence in students' abilities	3.74	0.83	.73	.37	.19	.31	.28	−.19	−.15	−.29
Meaningfulness	3.59	0.99	.82	.34	.19	.34	.25	−.19	−.13	−.31
Recognition	3.34	1.05	.83	.39	.19	.33	.27	−.21	−.14	−.32
Instrumental support	3.79	0.91	.77	.38	.20	.29	.26	−.21	−.15	−.32
Feedback	3.18	1.07	.84	.31	.16	.29	.23	−.17	−.14	−.26
Care	2.70	0.99	.75	.37	.18	.31	.27	−.22	−.15	−.33
Emotional support	3.47	1.05	.85	.40	.22	.31	.27	−.25	−.17	−.34
Cooperation	3.46	1.11	.83	.31	.20	.24	.23	−.19	−.13	−.25
Inspiration	3.41	1.03	.83	.41	.21	.41	.26	−.15	−.13	−.33
Demand-related lecturer behavior	2.26	0.79	.91	−.43	−.30	−.28	−.40	.39	.27	.43
Quantitative overload	2.89	1.08	.87	−.37	−.28	−.24	−.37	.37	.25	.37
Qualitative overload	2.55	0.98	.87	−.41	−.29	−.29	−.43	.37	.26	.42
Destructive behavior	1.50	0.77	.86	−.30	−.18	−.19	−.20	.22	.14	.28

Bivariate Pearson-Correlation coefficients. $N = 1{,}415$, $^{***}p < .001$ for all correlations. SS = Study satisfaction, SH = Subjective Health, SE = Study engagement, SSE = Study-related Self-efficacy, IR = Irritation, PC = Psychosomatic complaints, BU = Burnout.

5 Discussion

This study introduced and validated the I-HeaL, a theoretically grounded and psychometrically sound instrument designed to assess health-promoting and health-impairing behaviors of university lecturers from the students' perspective. Based on the JD-R model (Bakker and Demerouti, 2007), the instrument bridges findings from occupational leadership research with insights into health-promoting study conditions. This integration facilitates a deeper understanding of how lecturer behavior influences students' well-being and offers a differentiated analysis of specific behavioral dimensions and potential interaction effects.

The present findings align with previous research showing that supportive leadership behaviors enhance employee health by fostering resources and mitigating stressors (Inceoglu et al., 2018). Similarly, the I-HeaL results indicate that lecturers who engage in resource-oriented behaviors – such as providing feedback, transparency, and instrumental as well as emotional support – are associated with higher levels of student well-being and study engagement. In contrast, stressor-oriented behaviors, for instance, quantitative or qualitative overload, correspond to greater strain and lower study satisfaction. These findings mirror patterns observed in studies on destructive leadership (Mackey et al., 2021; Schyns and Schilling, 2013) and health-promoting leadership (Vincent-Höper and Stein, 2019), reinforcing the conceptual transferability of leadership–health mechanisms to the academic setting. In line with the COR theory (Hobfoll, 1989), these results suggest that resource gains foster well-being and engagement, whereas resource losses or threats to resources contribute to strain and dissatisfaction.

The study responds to recent calls for a more theory-driven examination of health-related study conditions (Eissler et al., 2020; Gusy et al., 2015; Hartmann et al., 2016). By systematically capturing both health-promoting and health-impairing lecturer behaviors, the I-HeaL offers a comprehensive view of the interpersonal and contextual factors shaping students' well-being. It moves beyond the narrow focus on social support (Herr et al., 2024; Vicary et al., 2024) and highlights the multifaceted nature of lecturer influence, encompassing workload management, feedback quality, and classroom climate.

From a theoretical perspective, the I-HeaL extends the SD-R model (Bakker and Mostert, 2024) by empirically demonstrating how lecturer behaviors function as proximal study resources – or, conversely, as stressors – that directly affect student health outcomes. This multidimensional framework allows for a differentiated analysis of behavioral domains and their potential interaction effects, thereby enriching our understanding of the mechanisms underlying student well-being in higher education.

The I-HeaL underscores the parallel mechanisms between leadership and lecturing, emphasizing the crucial role of lecturers as co-creators of supportive learning environments that foster student well-being (Eloff et al., 2023). Practically, it provides a reliable and evidence-based instrument for assessing lecturer behavior, with direct implications for health promotion in universities. The I-HeaL can inform training, professional development, and institutional interventions (Leathwood and Read, 2022), thereby strengthening

lecturers' capacity to cultivate healthy learning environments. By positioning lecturers as co-creators of academic working conditions (Beerkens and van der Hoek, 2022), this research bridges a critical gap between leadership theory and higher education practice, offering a promising framework for sustainable health management and student well-being in academia (Dooris et al., 2017).

5.1 Implications

5.1.1 Theoretical implications

The present findings offer valuable insights for further refining the JD-R, respectively, the SD-R model in academic settings (Bakker and Mostert, 2024). Specifically, the results provide empirical support for the notion that lecturer behaviors can function as proximal resources or stressors within the academic learning environment, thereby influencing student well-being. This contributes to a theoretical expansion of the SD-R model by explicitly integrating lecturer behavior as a key determinant of study-related demands and resources.

Furthermore, the findings lend themselves to testing the buffering hypothesis, which suggests that certain resource-related behaviors may mitigate the negative effects of academic demands in general (Bakker et al., 2005). Future studies could explore how resource-oriented lecturer behaviors – such as emotional support, constructive feedback, and transparency – moderate the relationship between academic demands and strain outcomes (Lesener et al., 2020; Lehnchen et al., 2025). Such analyses would help identify protective mechanisms and context-specific resources in higher education, thereby extending the theoretical reach and explanatory power of the JD-R and SD-R frameworks.

5.1.2 Practical implications

From a practical view, the findings align with the WHO's *Health Promoting Universities* framework (Tsouros et al., 1998), which positions higher education institutions as key settings for developing health literacy and strengthening personal and environmental resources. University students represent future professionals and leaders whose long-term employability and well-being are of societal and economic interest (Ackermann and Schumann, 2010; Gusy et al., 2015). Hence, universities bear the responsibility to create conditions that support both student mental health and academic success.

The I-HeaL can help to identify critical areas of lecturer behavior that influence student well-being. This enables targeted recommendations to strengthen resources and reduce demands. Lecturer training programs could incorporate I-HeaL findings to build awareness of their impact and provide strategies for creating health-supportive learning environments (Cotton et al., 2002; Holm-Hadulla et al., 2009). Integration into teaching evaluations and professional development initiatives could enable ongoing monitoring, institutional learning, and quality improvement (Leathwood and Read, 2022).

Unlike many current health interventions that focus on individual behavior of students (e.g., stress or time management training) (Worsley et al., 2022), this approach targets structural conditions that can be influenced by lecturer behavior. This perspective offers a complementary and potentially more sustainable approach to promoting student well-being and mental health in higher education (Dooris et al., 2017; Eloff et al., 2023). By identifying specific health-promoting and health-impairing behaviors, the instrument may inform future interventions aimed at improving learning environments through changes in academic leadership practices.

Furthermore, supportive learning environments benefit not only students but also lecturers. Evidence suggests that positive lecturer–student interactions enhance mutual engagement and academic staff well-being (Achermann Fawcett et al., 2018). In addition, promoting student mental health contributes to institutional success. Persistent experience of stress among students can lead to dropout or prolonged study durations, with financial and reputational costs for universities (Neugebauer et al., 2019). Furthermore, studies show positive associations between mental well-being and academic performance (Bakker et al., 2015; Chambel and Curral, 2005; Cotton et al., 2002; Schaufeli et al., 2002). Thus, fostering health-promoting lecturer behavior not only enhances student well-being but may also contribute to students' academic success and career development.

5.2 Limitations and future directions

As with any cross-sectional, self-report study, some limitations must be acknowledged. Causal conclusions cannot be drawn; it is possible that students' well-being influenced lecturer behavior (Ouweneel et al., 2011). Longitudinal research is needed to examine the directionality and the sustainable impact of effects. Additionally, future studies could employ multiple regression or SEM-based path modeling to make full use of the dataset's richness and to examine whether the identified dimensions account for unique variance in health-related outcomes.

Moreover, all data were collected via self-reports, which may result in a common method bias (Podsakoff et al., 2003). Social desirability or inaccurate self-perception may potentially inflate associations between perceived lecturer behavior and student well-being. This reliance on self-reporting may also limit the tool's applicability in contexts where objective or third-party assessments are preferred. Hence, future studies could use multi-source assessments (e.g., peer or teacher ratings), or apply mixed methods (e.g., observation, interviews) to strengthen construct validity. Besides, objective health indicators (e.g., cortisol) could be included, which would allow for triangulation of self-reported well-being with physiological data, thereby enhancing the validity of the findings. Such indicators could help detect stress responses that are not consciously perceived or reported by participants, offering a more nuanced understanding of health outcomes. To make this practicable, collaborations with medical or psychological departments could be considered, and non-invasive measures (e.g., saliva samples) could be used to ensure feasibility in university settings.

Additionally, the sample was split for cross-validation, but subsamples were not fully independent. Furthermore, although the sample size was relatively large, certain characteristics may limit the generalizability of the findings. The total number of invited students could not be reported due to the distribution of the survey, making it impossible to calculate the response rate and assess potential selection biases. Moreover, the sample was predominantly female, and certain fields of study (e.g., arts/design, agricultural sciences) were underrepresented, reducing heterogeneity. Hence, although the sample is adequate for initial

validation, further validation with more diverse and representative samples is required to ensure the robustness and generalizability of the I-HeaL findings.

Despite these limitations, the study has several strengths, including the large sample size, the use of cross-validation, and the development of a theoretically grounded instrument tailored to the academic context. These aspects provide a solid foundation for future research and practical applications of the I-HeaL tool.

6 Conclusion

This study systematically developed and validated the *Inventory for Health-Promoting Lecturing* (I-HeaL), a theoretically grounded and psychometrically robust measure for assessing lecturing behavior that influences student health and well-being. Empirically, the results supported a multidimensional structure of the I-HeaL, with good internal consistency and initial evidence for construct validity, demonstrated through significant associations with student well-being indicators. The instrument addresses a research gap by explicitly recognizing lecturers as key actors in shaping study conditions that affect well-being, drawing parallels with leadership in occupational settings to the higher education context. These findings contribute to the SD-R Model by demonstrating how specific lecturer behaviors can serve as resources that buffer study-related demands and foster student well-being. The development of the instrument, guided by both theoretical foundations and qualitative insights, ensures high practical relevance. In practical terms, the I-HeaL supports the design of structural health interventions in higher education and holds promise for advancing sustainable health management strategies aimed at enhancing student well-being, academic engagement, and long-term student development.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study involving humans was approved by University Hamburg, Hamburg, Germany. The study was conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SV-H: Writing – original draft, Writing – review & editing. JB: Writing – original draft, Writing – review & editing. DE: Writing – original draft, Writing – review & editing. MJ: Writing – review & editing.

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Supplementary material

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References

Achermann Fawcett, E., Keller, R., and Gabola, P. (2018) Bedeutung der Gesundheit von Schulleitenden und Lehrpersonen für die Gesundheit und den Bildungserfolg von Schülerinnen und Schülern. Allianz BGF in Schulen. Zürich und Lausanne: Pädagogische Hochschule Zürich und Haute école pédagogique Vaud. Available online at: www.radix.ch/bgf (Accessed April 2, 2025).

Ackermann, E., and Schumann, W. (2010). Die Uni ist kein Ponyhof: Zur psychosozialen Situation von Studierenden. *Prävent. Gesundheitsförd.* 5, 231–237. doi: 10.1007/s11553-010-0234-5

Akbar, Z., Khan, R. A., and Khan, H. F. (2023). Development and validation of an instrument to measure the micro-learning environment of students (MLEM). *BMC Med. Educ.* 23:395. doi: 10.1186/s12909-023-04381-3

Awais, A., Fu, N., and Jones, S. (2024). Developing students' resilience during the crisis: a moderated model linking college support, study demands, student resilience, and students' change-oriented behaviours. *High. Educ. Q.* 78, 565–585. doi: 10.1111/hequ.12468

Backhaus, K., Erichson, B., and Weiber, R. (2015). "Auswahlbasierte conjoint-analyse" in Fortgeschrittene Multivariate Analysemethoden (Berlin, Heidelberg: Springer Berlin Heidelberg).

Bakker, A. B., and Demerouti, E. (2007). The job demands-resources model: state of the art. *J. Manage. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., Demerouti, E., and Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *J. Occup. Health Psychol.* 10, 170–180. doi: 10.1037/1076-8998.10.2.170

Bakker, A. B., Demerouti, E., and Sanz-Vergel, A. (2023). Job demands–resources theory: ten years later. *Annu. Rev. Organ. Psychol. Organ. Behav.* 10, 25–53. doi: 10.1146/annurev-orgpsych-120920-053933

Bakker, A. B., and Mostert, K. (2024). Study demands–resources theory: understanding student well-being in higher education. *Educ. Psychol. Rev.* 36:92. doi: 10.1007/s10648-024-09940-8

Bakker, A. B., Sanz Vergel, A. I., and Kuntze, J. (2015). Student engagement and performance: a weekly diary study on the role of openness. *Motiv. Emot.* 39, 49–62. doi: 10.1007/s11031-014-9422-5

Balwant, P. T. (2016). Transformational instructor-leadership in higher education teaching: a meta-analytic review and research agenda. *J. Leadersh. Stud.* 9, 20–42. doi: 10.1002/jls.21423

Basson, M. J., and Rothmann, S. (2019). Pathways to flourishing among pharmacy students: the role of study demands and lecturer support. *J. Psychol. Afr.* 29, 338–345. doi: 10.1080/14330237.2019.1647953

Beerkens, M., and van der Hoek, M. (2022). "Academic leaders and leadership in the changing higher education landscape" in Research handbook on academic careers and managing academics (Cheltenham: Edward Elgar Publishing), 121–136.

Beierlein, C., Kovaleva, A., Lászlo, Z., Kemper, C. J., and Rammstedt, B. 2014) Eine Single-Item-Skala zur Erfassung der allgemeinen Lebenszufriedenheit: Die Kurzskala Lebenszufriedenheit-1 (L-1). GESIS-Working Papers, Vol. 2014/ 33. GESIS - Leibniz-Institut für Sozialwissenschaften. Available online at: https://www.gesis.org/fileadmin/_migrated/content_uploads/WorkingPapers_2014-33.pdf (Accessed April 15, 2025).

Chambel, M. J., and Curral, L. (2005). Stress in academic life: work characteristics as predictors of student well-being and performance. *Appl. Psychol.* 54, 135–147. doi: 10.1111/j.1464-0597.2005.00200.x

Cotton, S. J., Dollard, M. F., and De Jonge, J. (2002). Stress and student job design: satisfaction, well-being, and performance in university students. *Int. J. Stress. Manag.* 9, 147–162. doi: 10.1023/A:1015515714410

Curran, P. G. (2016). Methods for the detection of carelessly invalid responses in survey data. *J. Exp. Soc. Psychol.* 66, 4–19. doi: 10.1016/j.jesp.2015.07.006

Da Silva, J. A. M., Mininel, V., Agreli, H. F., Peduzzi, M., Harrison, R., and Xyrichis, A. (2022). Collective leadership to improve professional practice, healthcare outcomes and staff well-being. *Cochrane Database Syst. Rev.* 10:CD013850. doi: 10.1002/14651858.CD013850.pub2

Demerouti, E., and Nachreiner, F. (2019). Zum Arbeitsanforderungen-Arbeitsressourcen-Modell von Burnout und Arbeitsengagement – Stand der Forschung. *Z. Arbeitswiss.* 73, 119–130. doi: 10.1007/s41449-018-0100-4

Desimone, J. A., Harms, P. D., and Desimone, A. J. (2015). Best practice recommendations for data screening. *J. Organ. Behav.* 36, 171–181. doi: 10.1002/job.1962

Dooris, M., Doherty, S., and Orme, J. (2017). "The application of Salutogenesis in universities" in The handbook of Salutogenesis (Chem (CH): Springer), 237–245. doi: 10.1007/978-3-319-04600-6_23

Ducki, A., and Greiner, B. (1992). Gesundheit als Entwicklung von Handlungsfähigkeit: Ein arbeitspsychologischer Baustein zu einem allgemeinen Gesundheitsmodell. *Z. Arb. Organisationspsychol.* 36, 184–189.

Eissler, C., Sailer, M., Walter, S., and Jerg-Bretzke, L. (2020). Psychische Gesundheit und Belastung bei Studierenden. *Prävent. Gesundheitsförd.* 15, 242–249. doi: 10.1007/s11553-019-00746-z

Eloff, I., O'Neil, S., and Kanengoni, H. (2023). Students' well-being in tertiary environments: insights into the (unrecognised) role of lecturers. *Teach. High. Educ.* 28, 1777–1797. doi: 10.1080/13562517.2021.1931836

Flanagan, J. C. (1954). The critical incident technique. *Psychol. Bull.* 51, 327–358. doi: 10.1037/h0061470

Gilbert, W., Demanins, S. A., Bureau, J. S., Guay, F., and Morin, A. J. S. (2023). On the nature, predictors, and outcomes of undergraduate students' psychological distress profiles. *Learn. Individ. Differ.* 108:102378. doi: 10.1016/j.lindif.2023.102378

Grützmacher, J., Gusy, B., Lesener, T., Sudheimer, S., and Willige, J. 2018 Gesundheit Studierender in Deutschland 2017

Gumz, A., Erices, R., Brähler, E., and Zenger, M. (2013). Faktorstruktur und Gütekriterien der deutschen Übersetzung des Maslach-Burnout-Inventars für Studierende von Schaufeli et al. (MBI-SS). *PPmP Psychother. Psychosom. Med. Psychol.* 63, 77–84. doi: 10.1055/s-0032-1323695

Gusy, B., Lesener, T., and Wolter, C. (2019). Measuring well-being with the Utrecht work engagement scale – student form. *Eur. J. Health Psychol.* 26, 31–38. doi: 10.1027/2512-8442/a000027

Gusy, B., Lohmann, K., and Drewes, J. (2010). Burnout bei Studierenden, die einen Bachelor-Abschluss anstreben. *Präv. Gesundheitsförd.* 5, 271–275. doi: 10.1007/s11553-010-0251-4

Gusy, B., Lohmann, K., and Wörfel, F. (2015). "Gesundheitsmanagement für Studierende – eine Herausforderung für Hochschulen" in Fehlzeiten-Report 2015 (Berlin, Heidelberg: Springer).

Gusy, B., Wörfel, F., and Lohmann, K. (2016). Erschöpfung und Engagement im Studium. *Z. Gesundheitspsychol.* doi: 10.1026/0943-8149/a000153

Hartmann, T., Baumgarten, K., Hildebrand, C., and Sonntag, U. (2016). Gesundheitsfördernde Hochschulen. *Präv. Gesundheitsförd.* 11, 243–250. doi: 10.1007/s11553-016-0564-z

Herr, R. M., Birmingham, W. C., Deyerl, V. M., and Diehl, K. (2024). The relationship of ambivalence towards lecturers with university students' psychological distress and mental health. *Soc. Sci.* 13:10. doi: 10.3390/socsci13100538

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513

Hobfoll, S. E., Halbesleben, J., Neveu, J.-P., and Westman, M. (2018). Conservation of resources in the organizational context: the reality of resources and their consequences. *Annu. Rev. Organ. Psychol. Organ. Behav.* 5, 103–128. doi: 10.1146/annurev-orgpsych-032117-104640

Holm-Hadulla, R. M., Hofmann, F. H., Sperth, M., and Funke, J. (2009). Psychische Beschwerden und Störungen von Studierenden. *Psychotherapeut* 54, 346–356. doi: 10.1007/s00278-009-0693-3

Huang, J. L., Curran, P. G., Keeney, J., Poposki, E. M., and DeShon, R. P. (2012). Detecting and deterring insufficient effort responding to surveys. *J. Bus. Psychol.* 27, 99–114. doi: 10.1007/s10869-011-9231-8

Inceoglu, I., Thomas, G., Chu, C., Plans, D., and Gerbasi, A. (2018). Leadership behavior and employee well-being: an integrated review and a future research agenda. *Leadersh. Q.* 29, 179–202. doi: 10.1016/j.leaqua.2017.12.006

Iqra, N. (2024). A systematic – review of academic stress intended to improve the educational journey of learners. *Methods Psychol.* 11:100163. doi: 10.1016/j.metip.2024.100163

Kienle, R., Knoll, N., and Renneberg, B. (2006). "Soziale Ressourcen und Gesundheit: soziale Unterstützung und dyadisches Bewältigen" in Springer Lehrbuch Gesundheitspsychologie (Berlin, Heidelberg: Springer), 107–122.

Kim, S., Kim, H., Park, E. H., Kim, B., Lee, S. M., and Kim, B. (2021). Applying the demand–control–support model on burnout in students: a meta-analysis. *Psychol. Sch.* 58, 2130–2147. doi: 10.1002/pits.22581

Kunin, T. (1998). The construction of a new type of attitude measure. *Pers. Psychol.* 51, 823–824. doi: 10.1111/j.1744-6570.1998.tb00739.x

Leathwood, C., and Read, B. (2022). Short-term, short-changed? A temporal perspective on the implications of academic casualisation for teaching in higher education. *Teach. High. Educ.* 27, 756–771. doi: 10.1080/13562517.2020.1742681

Lehnchen, J., Helmer, S. M., Heinrichs, K., Burian, J., Deptolla, Z., Heumann, E., et al. (2025). Assessment of study conditions, needs for action and students' mental health in Germany – results from the cross-sectional StudiBiFra study. *J. Public Health*. doi: 10.1007/s10389-024-02387-9

Lesener, T., Blaszcyk, W., and Dastan, B (2022) Healthy Campus- Von der Bestandsaufnahme zur Intervention. Schriftenreihe des AB Public Health: Prävention und psychosoziale Gesundheitsforschung, Nr. 01/ P22. Available online at: https://www.fu-berlin.de/sites/healthy-campus/interventionsmanual/interventionsbeschreibungen/IK-Gesamtbericht.pdf (Accessed February 10, 2025).

Lesener, T., Pleiss, L. S., Gusy, B., and Wolter, C. (2020). The study demands-resources framework: an empirical introduction. *Int. J. Environ. Res. Public Health* 17:5183. doi: 10.3390/ijerph17145183

Luruli, K., Mostert, K., and Jacobs, M. (2020). Testing a structural model for study demands and resources, study engagement and well-being of first-year university students. *J. Psychol. Afr.* 30, 179–186. doi: 10.1080/14330237.2020.1767925

Ma, L., Tian, X., and Miao, J. (2025). The impact of teacher autonomy support on student engagement in higher education: exploring the mediating roles of student motivational beliefs and self-regulated learning. *Think. Skills Creat.* 59:102031. doi: 10.1016/j.tsc.2025.102031

Mackey, J. D., Ellen, B. P., McAllister, C. P., and Alexander, K. C. (2021). The dark side of leadership: a systematic literature review and meta-analysis of destructive leadership research. *J. Bus. Res.* 132, 705–718. doi: 10.1016/j.jbusres.2020.10.037

Meade, A. W., and Craig, S. B. (2012). Identifying careless responses in survey data. *Psychol. Methods* 17, 437–455. doi: 10.1037/a0028085

Mohr, G., and Müller, A. 2004 Psychosomatische Beschwerden im nichtklinischen Kontext. Zusammenstellung sozialwissenschaftlicher Items und Skalen (ZIS)

Mohr, G., Rigotti, T., and Müller, A. (2005). Irritation - ein Instrument zur Erfassung psychischer Beanspruchung im Arbeitskontext. Skalen- und Itemparameter aus 15 Studien. *Z. Arbeits-Organisationspsychol.* 49, 44–48. doi: 10.1026/0932-4089.49.1.44

Mokgele, K. R., and Rothmann, S. (2014). A structural model of student well-being. *S. Afr. J. Psychol.* 44, 514–527. doi: 10.1177/0081246314541589

Montano, D., Schleu, J. E., and Hüffmeier, J. (2023). A meta-analysis of the relative contribution of leadership styles to followers' mental health. *J. Leadersh. Organ. Stud.* 30, 90–107. doi: 10.1177/15480518221114854

Moosbrugger, H., and Kelava, A. (2020). Testtheorie und Fragebogenkonstruktion. Berlin, Heidelberg: Springer doi: 10.1007/978-3-662-61532-4.

Neugebauer, M., Heublein, U., and Daniel, A. (2019). Studienabbruch in Deutschland: Ausmaß, Ursachen, Folgen, Präventionsmöglichkeiten. *Z. Erziehungswiss.* 22, 1025–1046. doi: 10.1007/s11618-019-00904-1

Nübling, M:, Stößel, U., Hasselhorn, H.-M., Michaelis, M., and Hofmann, F.Freiburger Forschungsstelle Arbeits- und Sozialmedizin (FFAS). (2005) Methoden zur Erfassung psychischer Belastungen: Erprobung eines Messinstrumentes (COPSOQ). Schriftenreihe der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin Forschung, 1058. Wirtschaftsverlag Neue Wissenschaft, Verlag für Neue Wissenschaft. Available online at: https://www.copsoq.de/assets/pdf/BUCH-coposq-dt-baua-2005-Fb1058.pdf (Accessed October 16, 2025).

Ouweneel, E., Le Blanc, P. M., and Schaufeli, W. B. (2011). Flourishing students: a longitudinal study on positive emotions, personal resources, and study engagement. *J. Posit. Psychol.* 6, 142–153. doi: 10.1080/17439760.2011.558847

Pigeon, K. A. (2020). *College Freshmen Perspectives of Teaching and Learning About Emotional Wellbeing. [Phd Dissertation]* [Minneapolis (MN)]: Walden University. Available online at: https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=10895&context=dissertations

Pinho, L. G., Engström, M., and Schneider, B. C. (2025). Symptoms of anxiety and depression among health and social science students: a multicenter study. *Heliyon* 11:e41957. doi: 10.1016/j.heliyon.2025.e41957

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., and Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. doi: 10.1037/0021-9010.88.5.879

Polit, D., Beck, C., and Owen, S. (2007). Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. *Res. Nurs. Health* 30, 459–467. doi: 10.1002/nur.20199

Raghu, S., and Linus, B. (2024). The impact of organizational climate on the well-being and performance of healthcare professionals: a comprehensive systematic review of modern healthcare workplace and further research agendas. *J. Res. Bus. Manage.* 12, 08–21. doi: 10.5281/zenodo.10470617

Rigotti, T., Schyns, B., and Mohr, G. (2008). A short version of the occupational self-efficacy scale: structural and construct validity across five countries. *J. Career Assess.* 16, 238–255. doi: 10.1177/1069072707305763

Rosseel, Y. (2012). Lavaan: an R package for structural equation modeling. *J. Stat. Softw.* 48. doi: 10.18637/jss.v048.i02

Schaufeli, W. B., Martínez, I. M., Marques Pinto, A., Salanova, M., and Bakker, A. B. (2002). Burnout and engagement in university students: a cross-national study. *J. Cross-Cult. Psychol.* 33, 464–481. doi: 10.1177/0022022102033005003

Schmidt, L. I., Scheiter, F., Neubauer, A., and Sieverding, M. (2019). Anforderungen, Entscheidungsfreiräume und Stress im Studium. *Diagnostica* 65, 63–74. doi: 10.1026/0012-1924/a000213

Schyns, B., and Schilling, J. (2013). How bad are the effects of bad leaders? A meta-analysis of destructive leadership and its outcomes. *Leadersh. Q.* 24, 138–158. doi: 10.1016/j.leaqua.2012.09.001

Sieverding, M., Schmidt, L. I., Obergfell, J., and Scheiter, F. (2013). Stress und Studienzufriedenheit bei Bachelor- und Diplom-Psychologiestudierenden im Vergleich. *Psychol. Rundsch.* 64, 94–100. doi: 10.1026/0033-3042/a000152

Tavella, G., Hadzi-Pavlovic, D., and Parker, G. (2021). Burnout: redefining its key symptoms. *Psychiatry Res.* 302:114023. doi: 10.1016/j.psychres.2021.114023

Techniker Krankenkasse. 2023 TK Gesundheitsreport 2023 - Wie geht's Deutschlands Studierenden. Available online at: https://www.tk.de/resource/blob/2149886/13f9f4a889e628208033bd8dabcced82/2023-tk-gesundheitsreport-data.pdf (Accessed January 27, 2025).

Tsouros, A. D., Dowding, G., Thompson, J., and Dooris, M. (1998) Health promoting universities: Concept, experience and framework for action. World Health Organization. Regional Office for Europe. Available online at: http://apps.who.int/iris/bitstream/10665/108095/1/E60163.pdf?ua=1 (Accessed April 15, 2025).

Ventura-León, J., Caycho-Rodríguez, T., Sánchez-Villena, A., Peña-Calero, B., and Sánchez Rosas, J. (2022). Academic inspiration: development and validation of an instrument in higher education. *Electron. J. Res. Educ. Psychol.* 20, 635–660. doi: 10.25115/ejrep.v20i58.5599

Vicary, E., Kapadia, D., Bee, P., Bennion, M., and Brooks, H. (2024). The impact of social support on university students living with mental illness: a systematic review and narrative synthesis. *J. Ment. Health.* 1–13. doi: 10.1080/09638237.2024.2408237

Vincent, S. (2011). "Gesundheits- und entwicklungsförderliches Führungsverhalten: ein Analyseinstrument" in Fehlzeiten-Report 2011: Führung und Gesundheit: Zahlen, Daten, Analysen aus allen Branchen der Wirtschaft (Berlin, Heidelberg: Springer).

Vincent-Höper, S., Gregersen, S., and Nienhaus, A. (2017). Do work characteristics mediate the negative effect of transformational leadership on impaired well-being? *Zeitschrift Arbeits Organisationspsychol.* 61, 167–180. doi: 10.1026/0932-4089/a000249

Vincent-Höper, S., and Stein, M. (2019). The role of leaders in designing employees' work characteristics: validation of the health- and development-promoting leadership behavior questionnaire. *Front. Psychol.* 10:1049. doi: 10.3389/fpsyg.2019.01049

Wickramaratne, P. J., Yangchen, T., Lepow, L., Patra, B. G., Glicksburg, B., Talati, A., et al. (2022). Social connectedness as a determinant of mental health: A scoping reviewa. *PloS one*, 17:e0275004. doi: 10.1371/journal.pone.0275004

Wörfel, F., Gusy, B., Lohman, K., and Kleiber, D. (2015). Validierung der deutschen Kurzversion des Maslach-Burnout-Inventars für Studierende (MBI-SS KV). *Z. Gesundheitspsychol.* 23, 191–196. doi: 10.1026/0943-8149/a000146

Wörfel, F., Gusy, B., Lohmann, K., Töpritz, K., and Kleiber, D. (2016). Mental health problems among university students and the impact of structural conditions. *J. Public Health* 24, 125–133. doi: 10.1007/s10389-015-0703-6

World Health Organization. (1948). Constitution of the World Health Organization. Available online at: http://apps.who.int/gb/bd/PDF/bd47/EN/constitution-en.pdf?ua=1 (Accessed April 15, 2025).

Worsley, J., Pennington, A., and Corcoran, R. (2022). Supporting mental health and wellbeing of university and college students: a systematic review of review-level evidence of interventions. *PLoS One* 17:e0266725. doi: 10.1371/journal.pone.0266725