

**Connecting Campus and Resilience:  
Exploring the Relationship between Place Attachment, Community Resilience, and  
Psychological Well-being in the University Setting**

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### Abstract

The present study adopted a quantitative cross-sectional design and was part of a larger study to gain more insight into the concept of community resilience, its contributors, and its consequences. The aim of this research was to shed light on the relationships between students' place attachment (PA) to campus, their perceived community resilience (CR), and their psychological well-being (PWB) in the university context and examine if CR mediates the relationship between PA and PWB. The participants ( $N = 90$ ), who were students at the University of Twente (Netherlands), were asked to fill out an online survey comprising, among others, three different psychological scales to measure their PA, CR, and PWB respectively and a few optional open questions. The results showed significant positive relationships between each of the three variables yet revealed that the relationship between PA and PWB is not mediated by CR. Answers to the open questions suggested that memories, as the cognitive aspect of PA, and peer relationships might be more relevant for students' attachment to campus. As the university is an inherently temporary place for short-term stay, students' PA might manifest differently in relation to campus. Results further supported previous findings showing the significance of PA for CR and the relevance of resilient communities and attachment to campus to facilitate students' PWB. This study was the first to examine the interplay among PA, CR, and PWB within the university context and showed that their relationships also hold in this setting. Thus, suggestions were made as to how universities could facilitate PA to campus and university CR to contribute to improved support and facilitation of well-being among university students.

*Keywords:* university community resilience, place attachment, psychological well-being, university students

## **Connecting Campus and Resilience: Exploring the Relationship between Place Attachment, Community Resilience, and Psychological Well-being in the University Setting**

Globally, the number of disasters and other threats is rising with an upward trend, increasing the risk for communities that need to adapt and recover from the respective consequences of such hardships. The number of natural disasters has increased by ten times from 1960 to 2019; resulting and independent ecological threats are growing with futile prognosis (Institute for Economics and Peace, 2020) and climate change and globalisation pose new challenges for global and local communities (Kovalčíková, 2014; Crimmins et al., 2016). Further, human-made conflicts such as the current events in Iran or the war in Ukraine pose significant challenges to the communities and their members' well-being (Chaaya et al., 2022; Immenkamp, 2022; Levy & Sidel, 2016; Sheather, 2022; United Nations, 2022). Lastly, the COVID-19 pandemic and its concomitant factors, such as reduced personal interaction, the closing of teaching facilities, or increasing unemployment, impacted communities (Putri et al., 2022; Sharifi & Khavarian-Garmsir, 2020) and negatively affected their individuals' well-being (Patterson et al., 2021; Wu et al., 2020; Yang & Ma, 2020). However, despite all adversities, the local and global communities have often accumulated great strength to support each other in recovery (Cassidy, 2023; Federal Emergency Management Agency, 2021; Kelemen, 2022; Pavarini, 2023; Support Ukraine Now, n.d.; Wu et al., 2022).

This study was conducted as part of a larger survey that focused on a community's capacity to recover, adapt, and grow after difficulties, meaning its resilience. Particularly, this paper focuses on said capacity within a university community. More specifically, the purpose was to investigate how the attachment students have to the university campus relates to the resilience of a university community and what relation both factors have to students' psychological well-being.

### **Theoretical Framework**

#### ***Resilience and Communities***

When discussing disasters or other threats and their influence on well-being, resilience is a commonly encountered characteristic due to its potential to protect from the negative consequences of such events. The term itself originates in material physics, where it comprises the ability of an object to rebound to its original shape after deformation (Kirmayer et al., 2009). However, within the field of psychology, *resilience* is generally viewed as a form of positive adjustment in the face of hardships (Kirmayer et al., 2009). In this context, Barton (2005) suggests

that resilience might similarly apply to more marginal day-to-day events, not just catastrophic or large-scale ones. Resilience can manifest at several distinct levels, including the individual, community, or societal level, and in different contexts, such as human development or disasters (Barton, 2005; Kirmayer et al., 2009; Koliou et al., 2018). At the individual level, resilience is defined as one's "ability to overcome stress and adversity" (Kirmayer et al., 2009, p. 64), which reflects the strength-focused approach inherent to the concept of resilience (Barton, 2005; Kirmayer et al., 2009). Nevertheless, a more critical perspective highlights the limitations of this conceptualisation as it disregards the impact of society and culture on the individual's ability (Ungar, 2011a; Ungar, 2011b).

Thus, Ungar (2011a) argues that resilience is better understood as the ability of individuals to access resources facilitating their well-being and of communities to provide these resources. This expanded view of resilience highlights the interaction of individual and community factors and underscores the importance of communities in facilitating healing and growth during the process of overcoming adversities (Kirmayer et al., 2009; Sonn & Fisher, 1998; Ungar, 2011b), such as a pandemic or a war. Substantiating this, the literature suggests that often individual success is constrained by the success of the community, which in turn is contingent on the available resources of the respective community (Obrist et al., 2010; Ungar, 2011a). These findings demonstrate the importance of resilient communities in providing resources for individual well-being and promoting a sustainable recovery in times of hardship and other challenges (Kirmayer et al., 2009; Mental Health Foundation, 2013; Murray & Zautra, 2011; Quinn et al., 2020; Ungar, 2011b).

Considering this importance, it is crucial to define exactly what *community resilience* is. To start with, a *community* is "any group of individuals that share common interests, identify with one another, have a common culture, and participate in shared activities" (Fellin, 1995, as cited in Ungar, 2011b, p. 1), but it can also refer to particular geographically populated places (Pretty et al., 2003). As for the concept of community resilience, a systematic review (Patel et al., 2017) and a recent content analysis (Fan & Lyu, 2021) revealed that there is no consensus among the scientific community and respective definitions are far from coherent. Some definitions emphasise the continuous process of adaptation that communities undergo after facing adversity (Norris et al., 2007), while others focus on a community's provision of and access to resources to support people's well-being (Cénat et al., 2021; Patel et al., 2017). The working definition used within this

paper integrates both approaches and conceptualises *community resilience* as a community's "social capital, physical infrastructure, and culturally embedded patterns of interdependence that give it the potential to recover from dramatic change, sustain its adaptability, and support new growth that integrates the lessons learned during a time of crisis" (Ungar, 2011b, p. 1742).

Yet, to harness this potential, it needs to be understood what and how factors enable the emergence and maintenance of resilient communities. However, according to Fan and Lyu's (2021) content analysis of two decades of research, the study of community resilience is still in its early stages, particularly in terms of empirical research. Further work is needed to develop and refine conceptual frameworks and promote cross-cultural and comparative research for a holistic understanding of community resilience (Fan & Lyu, 2021). Among the existing research, the insight on contributing factors is inconclusive. While some studies conceptualise certain factors (e.g., belongingness) as contributors to community resilience (Kulig et al., 2013), others identify or measure them as indicators of community resilience (Cénat et al., 2021), which is problematic for validating the function of resilience (Kulig et al., 2013). To develop a more accurate picture of the complex dynamics that support resilience in communities, which can ultimately inform real-life practice, it is necessary to investigate factors contributing to and resulting from community resilience, which was the purpose of this study.

**Community Resilience and University.** A university is usually a geographically determined place where people with shared interests participate in various shared activities (e.g., same study track, classes, student organisations, sports), which makes it a community. As many students relocate for university (Centraal Bureau voor de Statistiek, 2021; Maastricht University & constata, 2019) and thus often leave their local communities, the focus of connection and belonging shifts to the new university communities (Kelly & Mulrooney, 2019). Recently, the COVID pandemic has extremely limited the possibility for students to access communities: those at home due to travel restrictions (Bowditch, 2020) and/or those on-site due to the shift to online education (4TU Centre for Engineering Education, 2021). Given a resilient community's potential to support well-being and recovery during challenging life periods or hardships like this pandemic, this study aimed to shed light on the university community, as it is often where students' daily lives take place.

While research on individual student resilience is prevalent (Gómez-Molinero et al., 2018; Hernandez et al., 2022; Serrano Sarmiento et al., 2021; Xu et al., 2021), the number of English-

language papers specifically exploring the resilience of university communities is limited. If attention is devoted to the campus or university, it is often in the context of disaster resilience concerning crime or natural risks (e.g., flooding) (Department of Homeland Security, 2017; Kapucu & Khosa, 2013). Other related scientific contributions are a report exploring how secondary education institutions can contribute to enhancing broader community resilience (Fay et al., 2020) or an investigation of a whole-community approach to facilitating community resilience in institutions of higher education (Plodinec et al., 2014). For many students, entering university opens the doors to a new and potentially central community in their lives. Given the potential resilient university communities can hold for students, the scarcity of (empirical) research on this topic highlights the relevance of investigating this topic and contributing factors more thoroughly to support students in more evidence-based ways.

### ***Place Attachment and Community Resilience***

One factor emerging in the scientific literature as relevant for community resilience is place attachment. *Place attachment* (PA) is generally referred to as a bond that a person has with their environment (Indayani et al., 2021; Lewicka, 2011; Scannell & Gifford, 2010). More specifically, the current study adopts the definition of Scannell and Gifford (2010), who define PA as the “bond between an individual or group and a place that can vary in terms of spatial level, degree of specificity, and social or physical features of the place” (Scannell & Gifford, 2010, p. 5). PA is embodied by a person’s positive feelings towards a specific location (affect), including the actions taken to sustain a connection with the place (behaviour) and the memories and thoughts associated with it (cognition) (Scannell & Gifford, 2010). In the past, PA has elicited much interest and scientific attention, partly due to modern mobility and globalisation posing potential threats to a bond between person and place (Giuliani, 2003; Hashemnezhad et al., 2013; Indayani et al., 2021; Lewicka, 2011; Polfliet, 2020), and thus, PA has been investigated from many perspectives (e.g., disaster psychology, immigration research, mobility, safety perceptions), as Scannell and Gifford (2010) show in an extensive literature review and synthesis.

In this context, several findings point towards a relationship between PA and community resilience. To start with, a cross-sectional study by Indayani et al. (2021) showed that PA positively relates to community resilience, yet they point out that there are also other important factors in predicting community resilience next to PA. Berkes and Ross (2013) support the relevance of PA for community resilience, showing that the connection between place and person can aid in

establishing community resilience, although the significance of such a relationship should be further investigated. Similarly, PA was found to be an impetus to improve the capacity of community members to cope with and overcome challenges in tourist destinations (Guo et al., 2018). Most significantly, Faulkner et al. (2018) conducted a qualitative study among two UK communities that revealed PA as the most crucial requirement and mobilisation for community resilience as other factors influencing community resilience (e.g., community cohesion, community networks, and knowledge) built on it. Thus, these findings assign relevance to PA in relation to community resilience but also suggest that this connection needs further investigation.

**Place Attachment and University Campus.** Given this important role of PA, examining it in the university context can advance our understanding of the foundational mechanisms that allow students to access the benefits of a resilient university community. Students often move from their home countries or cities to the university areas (Centraal Bureau voor de Statistiek, 2021; UNESCO Institute for Statistics, n.d.), and high degrees of mobility or short-term residency are sometimes assumed to conflict with the development of PA, as discussed by Lewicka (2011). However, research findings suggest that PA can exist despite increased mobility (Gustafson, 2009a; Gustafson, 2009b; Gustafson, 2013) or having multiple places of residency (Kelly & Hosking, 2008; Van Patten & Williams, 2008), and that attachment to more than one place is possible (Scannell & Gifford, 2014).

Furthermore, in the past decade, there has been a rising interest in the relationship between students and their PA, either to the university city (Fluit, 2016; Polfliet, 2020) or to the university (campus) itself (Li, 2011; Moghisi et al., 2015; Qingjiu & Maliki, 2013). Scrutinising this relationship, Polfliet (2020) found in her master's thesis that PA levels among different student cohorts display an s-curve variation, with the highest PA levels during the studies and a stagnation at the end of the studies. The cross-sectional study by Qingjiu and Maliki (2013) supports this, as freshmen students displayed the lowest PA levels, and junior students reported higher PA compared to seniors.<sup>1</sup> Additionally, they showed that international students demonstrated lower PA than national ones. Hence, while PA has been researched among university students, there is a notable gap in understanding its relationship with community resilience. Given the recognised significance of PA for community resilience and the potential challenges faced by (international)

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<sup>1</sup> Freshman, junior and senior are referring to the first, third and fourth year of US undergraduate education, respectively.

students in developing PA, it is crucial to understand the relationship between students' PA and the community resilience of their university. Such understanding can inform evidence-based support strategies for students in a more comprehensive manner. Consequently, this paper aimed to examine PA in relation to university community resilience.

### ***Place Attachment, Community Resilience and Well-being***

As the world grapples with pressing social problems such as war, environmental crises, and the COVID pandemic, as well as rising stress levels, challenges to mental health, or social disconnection, this threatens communities and individual well-being (Chaaya et al., 2022; Leigh-Hunt et al., 2017; Levy & Sidel, 2016; Nochaiwong et al., 2021; Patterson et al., 2021; Putri et al., 2022; World Health Organization (WHO), 2022; Wu et al., 2020; Yang & Ma, 2020). Illustrating its relevance, the topic of mental well-being has gained increasing attention from researchers, policymakers, and communities (Cooke et al., 2016; Dhanabhakyaam & Sarath, 2023; Grzywacz et al., 2004; O'Donnell et al., 2014; WHO, 2004). More specifically, research has shown that mental health problems among the student population are a serious and rising concern (Kelders et al., 2019; National Institute for Public Health and the Environment, 2021; Pereira et al., 2020). Considering this concerning trend and the fact that university is a major transition period for many students, this study aimed to examine the relationships between community resilience, PA and students' well-being, which is crucial for addressing and supporting their mental health. Existing literature suggests that both community resilience and PA are associated with well-being, and each connection will be explored individually.

**Place Attachment and Well-being.** PA can be linked to different expressions of individual well-being. In this study, well-being is defined as psychological well-being manifested as positive human functioning related to purpose and meaning in life, which promotes satisfaction and positive emotions (Huppert, 2009; Ryff, 1989). To start with, the mixed-methods study by Scannell and Gifford (2017) found 13 different perceived psychological advantages of PA that include, among others, positive emotions, personal growth, belonging, memories, comfort, security, or relaxation. Similarly, PA can be associated with well-being, as it has been shown to be related to feelings of comfort, happiness, and life satisfaction (Billig et al., 2006; Giuliani, 2003). According to Scannell and Gifford (2014), it is critical for individuals who have relocated to establish a connection to the new location to generate a sense of place, as this affects their well-being and adjustment. Additionally, illustrating the link between PA and well-being, PA was found to



mediate the relationship between local social identity and individuals' well-being (Maricchiolo et al., 2021). More specifically in relation to the university context, no or low levels of PA relate to higher levels of homesickness among students (Scannell & Gifford, 2014), which negatively impacts their well-being (Fluit, 2016).

**Community Resilience and Well-being.** Previously, the benefits of community resilience and its potential to facilitate individual resilience and well-being were branched, yet it is crucial to elaborate on this association. Within the discussed global and local crises, communities are an important source of resources and strength for recovery and adaptation (Cassidy, 2023; Federal Emergency Management Agency, 2021; Kelemen, 2022; Support Ukraine Now, n.d.; Wu et al., 2022). Reasonably, community resilience is linked to individual well-being, as people can use the resources provided by the community to facilitate their adaptation, healing, and growth to overcome disasters or other hardships (Cénat et al., 2021; Mental Health Foundation, 2013; Norris et al., 2007; Ungar, 2011a; Ungar, 2011b). More specifically, Quinn et al. (2020) found that two constituents of community resilience (i.e., belonging and relationality) were related to individual well-being. Additionally, Cénat et al. (2021) showed that overall community resilience is negatively correlated to depression, which is directly related to reduced well-being, and positively correlated with individual resilience, which was found to relate to and predict constituents of psychological well-being (Klainin-Yobas et al., 2021; Smith & Hollinger-Smith, 2014).

### **The Current Study**

The community resilience of universities carries great potential for facilitating coping and recovery among students in times of adversity and can promote students' individual resilience and well-being. In light of this potential, it is paramount to understand how to cultivate resilient university communities to support students in better evidence-based ways. PA is a relevant factor emerging in the literature, and developing a greater understanding of this concept among university students in relation to community resilience is important due to its potential and the challenges students might face in developing PA to the university campus. Further, considering the individual and societal relevance of psychological well-being, shedding light on a complex network of influencing factors can support the facilitation of well-being among students. The individual relationships established between these three variables suggest a possible mediating function of community resilience in the relationship between PA and well-being. This study aims to address the gap in literature in relation to research on university community resilience, especially in

interaction with PA and psychological well-being. To scrutinise those relations, the current study will focus on students studying at the University of Twente (UT) in Enschede (Netherlands), as this research was conducted in the realm of a bachelor's thesis at the UT. Hence, the following research question and respective hypotheses are posed:

*How do students' PA, their psychological well-being, and their perceived university community resilience relate to each other, and does the perceived UT community resilience of UT students mediate the relationship between the students' attachment to the UT campus and their psychological well-being?*

**H1:** The level of students' attachment to the UT campus is positively related to the UT students' psychological well-being.

**H2:** The level of students' attachment to the UT campus is positively related to the perceived UT community resilience of UT students.

**H3:** The perceived UT community resilience of UT students is positively related to their psychological well-being.

**H4:** The perceived UT community resilience of UT students mediates the relationship between students' attachment to the UT campus and their psychological well-being.

## Methods

### Participants

The present study adopted a quantitative cross-sectional design and involved 133 students from the UT. Inclusion criteria were being 18 years of age or older and being enrolled as a student at the UT. Participants were excluded if they did not give their informed consent, did not finish the questionnaire, or falsely answered the two attention-check items. The final sample comprised 90 students, 60 of whom identified as being female (66.7%) and 30 as being male (33.3%). Respondents were from 24 different countries of origin, but mainly from the Netherlands (37.8%) and Germany (34.4%), and their ages ranged from 18 to 30 ( $M_{\text{age}} = 21.2$ ,  $SD = 1.9$ ). Among the participants, 18 indicated to live on campus (20%), 51 to live in Enschede (56.7%), and 21 resided somewhere else (23.3%). The participants belong to 18 different study fields, with the majority being from psychology (41.1%). Among the participants, 24 students were in bachelor's year one (26.7%), 15 students in year two (16.7%), and 36 students in year three (40%). Moreover, 11

students were in their first year of their master's (12.2%), and four students were in their second year of their master's (4.4%). Respondents were recruited via convenience and snowball sampling. The study was made available to the student pool of psychology and communication science via the website SONA, where students with access were compensated 0.25 credits for their participation. Next to SONA (10%), the researchers' networks were used as participants were invited to participate via text message (35.6%), asked in person (e.g., on campus) (51.1%) while being offered a piece of chocolate as compensation, or in another way (e.g., via a flyer with a QR code) (3.3%).

## **Materials**

The current study was part of a larger survey that concerned the topic of community resilience (CR) and aimed to inquire into the antecedents and consequences of CR in the university setting in an attempt to expand the theoretical knowledge around this topic. Investigated concepts in relation to CR were PA, uncertainty intolerance, self-efficacy, and psychological well-being (PWB). This paper focuses on the interplay between PA, university CR, and PWB among UT students. Hence, only the respective instruments will be discussed in this section.

### ***Community Resilience***

Students' perceived university CR was measured using the English version of the Transcultural Community Resilience Scale (T-CRS) (Appendix A) by Cénat et al. (2021). The T-CRS is a 28-item self-report inventory that assesses a community's ability to furnish its members with the essential resources for developing resilience. The T-CRS has a three-factor structure: community strengths and support (items 1 to 14), community values (items 15 to 19), and community trust and faith (items 20 to 28). Although the T-CRS does not include the adaptation or growth aspect in defining CR, it was chosen due to its strong psychometric properties and transcultural applicability, which suited the study population. The T-CRS was shown to have satisfactory concurrent validity and very good overall internal consistency ( $\alpha = .96$ ), including the three subscales ( $\alpha$  ranging from .88 to .95.) (Cénat et al., 2021). Participants express their agreement with each item on a 5-point Likert scale, which ranges from totally disagree (1) to totally agree (5), and mean scores were calculated for each participant. Higher scores indicated greater university CR, and every respondent could obtain a score between a minimum of 1 and a maximum of 5. Additionally, the items were adapted to refer specifically to the university community (e.g., I share the values of my university community). In this study, Cronbach's alpha for the overall

TCR-S was excellent ( $\alpha = .93$ ), and confirmatory factor analysis verified the one-factor structure of the scale.

### ***Place Attachment***

The English short form of the Psychological Place Attachment Scale (PPAS-SF) by Li and Frieze (2016) was adopted to measure UT students' PA to the UT campus (Appendix B). The PPAS-SF is a 13-item self-report questionnaire that assesses the cognitive, affective, and behavioural aspects of PA. The scale was chosen due to its excellent internal consistency reliability ( $\alpha = .90$ ) based on students aged from 18 to 22 from the University of Pittsburgh (USA) (Li & Frieze, 2016), and the extended version of the PPAS has also been shown to have high validity (Frieze et al., 2011). Items were rated on a 5-point Likert scale ranging from strongly disagree (1) to strongly agree (5), and six items were reverse coded (i.e., 6 - Likert score). Thereby, higher scores reflect greater PA. As items were averaged to create a mean score per participant, one could obtain a mean PA score between a minimum of 1 and a maximum of 5. The wording of some items was changed so that the grammatical structure fits the context. For instance, "I feel happy when I am in \_\_\_" was changed to "I feel happy when I am *at* the UT". In this study, Cronbach's alpha for the PPAS-SF was good ( $\alpha = .85$ ), and confirmatory factor analysis verified the one-factor structure of the scale.

### ***Psychological Well-being***

The English version of the 18-item Psychological Wellbeing Scale (PWB-S) by Ryff and Keyes (1995) was employed to assess student well-being (Appendix C). As previously defined, PWB refers to positive human functioning related to purpose and meaning in life, which promotes satisfaction and positive emotions (Huppert, 2009; Ryff, 1989). PWB was selected as a measure of well-being because it is a rather stable construct not easily influenced by short-term fluctuations in mood (Huppert, 2009) that aligns with the previously discussed consequences of PA and CR for well-being. Moreover, resilience has been linked to PWB (Klainin-Yobas et al., 2021), suggesting a potentially similar link between CR and PWB. The PWB-S comprises subscales that respectively assess the six aspects of PWB: self-acceptance, positive relations with others, autonomy, personal growth, environmental mastery, and purpose in life (see Appendix C for exact items). However, the subscales of the 18-item version have been shown to possess only low to moderate internal consistency (Keyes et al., 2002; Wilson et al., 2013), and the six-factor structure of the 18-item version has been questioned (Klainin-Yobas et al., 2020). Despite this criticism, the 18-item scale

was adopted to minimise the respondent's workload due to the multitude of questionnaires applied within the survey and since no use was made of the subscale structure. Respondents rated the items on a 7-point Likert scale ranging from strongly agree (1) to strongly disagree (7), and ten items were reverse coded (8 - Likert score) so that higher scores reflected greater PWB. An overall mean scale score was calculated per person, whereby each respondent could obtain a scale score between 1 and a maximum of 7. Example items were "I like most parts of my personality" or "I am good at managing the responsibilities of daily life". In this study, Cronbach's alpha for the overall PWB-S was good ( $\alpha = .84$ ), and confirmatory factor analysis verified the one-factor structure of the scale.

### **Procedure**

The present study was approved by the BMS ethical committee (request number 230278). The survey was conducted via Qualtrics (<https://www.qualtrics.com>), and the data was collected in April and May 2023. An overview of the whole survey flow can be found in Appendix D. At the start, participants were given a brief introduction explaining the aim of the study, which was followed by an informed consent form clarifying the participants rights, confidentiality, and data handling. Additionally, it was ensured that the participants understood the provided information, and the email addresses of the three researchers were provided in case of questions or requests for data removal. Participants were made aware that the study would take 20–25 minutes and were then actively asked for consent. Only those agreeing proceeded to indicate their socio-demographic information (age, gender, nationality, field and year of study, living location and duration, days spent on campus, and how they learned about the survey). Subsequently, participants could start the main part of the survey, which comprises five forced response scales and five optional open questions. The first questionnaire presented was the T-CRS, followed by two open questions about participants' feelings of belonging to the UT community and their perspectives on the university's CR. The T-CRS comprised an attention check between items 17 and 18 that required respondents to indicate a specific response option. Next, participants filled out the PPAS-SF and were asked about their level of PA to the UT and the reasons behind it. Afterwards, respondents filled out the PWB-S, which included a second attention check between items 10 and 11. This was followed by the general self-efficacy scale (Schwarzer & Jerusalem, 1995). Next, students were asked whether they studied at the UT at any time when COVID measures were implemented (12.3.2020 - 25.2.2022). If they indicated yes, they were asked to fill out the intolerance of uncertainty scale (Buhr & Dugas, 2002) while thinking of the time when COVID measures were in place at UT.

This was followed by an open question about students' experiences of uncertainty during that time frame. If they did not study at UT at any time when COVID measures were implemented, they filled out the intolerance of uncertainty scale keeping in mind how they felt the past month and optionally elaborated about their uncertainty and reasoning for it, if applicable. Lastly, participants were informed that this was the end of the survey and that their responses were recorded.

### **Data Analysis**

The objective of the research was to examine the relationships between PA, PWB, and CR in the university context and to investigate whether there is a mediation effect of perceived UT CR among UT students in the relationship between students' level of PA to the UT campus and their PWB. Hence, the two independent variables were PA and CR (mediator), and the dependent variable was PWB. After closing the data collection, the data was exported from Qualtrics in numeric and text types and imported into the statistical software programme *RStudio* (Version 2023.03.1+446) for the purpose of analysis. In preparation for the data analysis, both data sets were restructured and cleaned, along with other relevant adjustments. Next, frequency tables were generated to assess the variation in responses on the demographic items, and the participant's age was summarised using mean and standard deviation. To ensure a higher score indicates a higher level of the measured construct, relevant items of the PPAS-SF and the PWB-S were reverse coded, and mean scores per participant were computed for each scale and stored in the data set so that each participant obtained one overall scale score. Further, mean, standard deviation, and reliability (Cronbach's alpha) were assessed per scale, as well as the reliability of the subscales from the TCR-S and the PWB-S. To ensure the quality of the data, the scale mean scores were checked for outliers. Next, the assumptions for a multiple linear regression were checked, namely linearity (three scatterplots), normality (histogram of model residuals), multicollinearity (variance inflation factor), and homoscedasticity (Breusch-Pagan test). Log-transformation and square root transformation were applied to address violations. Afterwards, confirmatory factor analysis was performed per overall scale to assess the fit of the measurements to the observed data, but not for any subscales. For the main analysis, correlations between the three variables and their significance were determined. Subsequently, three linear regressions were modelled (PA-PWB, PA-CR, and CR-PWB), and their significance was assessed. To investigate the mediation, a multiple linear regression was modelled, and a causal mediation analysis was performed to scrutinise the direct and indirect effect of PA on PWB mediated by CR. Nonparametric bootstrapping with 1,000

resamples was applied to estimate the confidence intervals of the effects, and the seed value for the random number generator was set to 234 to ensure reproducibility of the results during bootstrapping. Additional analysis was performed to investigate if students' living location (i.e., Enschede, campus, or other) or their nationality (Dutch vs. international) affected their PA via separate one-way ANOVAs and the Tukey post-hoc test. Additionally, students' answers to the open questions on CR and PA were scanned for recurring patterns or other things that stood out. The aim was to explore the qualitative data and generate a first insight into students' perceptions to understand the quantitative results more comprehensively.

## Results

### Descriptive Statistics

Mean, standard deviation, reliability, and intercorrelations between the three constructs PA, CR, and PWB are displayed in Table 1. The internal consistency reliability for all three scales ranges from good ( $\alpha \geq .80$ ) to excellent ( $\alpha \geq .90$ ) (George & Mallery, 2003), and significant positive correlations were found between PA, CR, and PWB, respectively. Thus, higher levels of one construct relate to higher levels of the other construct.

**Table 1**

*Mean, Standard Deviation, Reliability, and Intercorrelations of the Three Variables*

Variable	<i>M</i>	<i>SD</i>	Cronbach's $\alpha$	1	2	3
1. Place attachment	3.7	0.5	.85		.62***	.30**
2. Community Resilience	3.5	0.6	.93			.30**
3. Psychological Well-being	5.3	0.8	.84			

*Note.* \*\*  $p < .01$ . \*\*\*  $p < .001$ .

### Preliminary Analysis

Checking the subscale reliability ( $\alpha$ ), all three subscales of the TCR-S show satisfactory internal consistency ( $\alpha \geq .72$ ). The PWB-S subscales, however, show a wide range in internal consistency ( $.30 \geq \alpha \leq .80$ ). Nevertheless, removing the purpose in life subscale with unacceptable

internal consistency ( $\alpha = .30$ ) did not improve the overall reliability of the PWB-S. Hence, since this study made sole use of the overall scale score, no sub-scales were removed for the main analysis. Further, no outliers were found in the scale data. During the assumption check, the Breusch-Pagan test showed the assumption of homoscedasticity was violated ( $p = .017$ ) for the mediation model. However, since neither the log-transformation ( $p = .003$ ) nor the square root transformation ( $p = .007$ ) were able to remove the violation, no transformations were applied for the main data analysis.

### **Main Analysis**

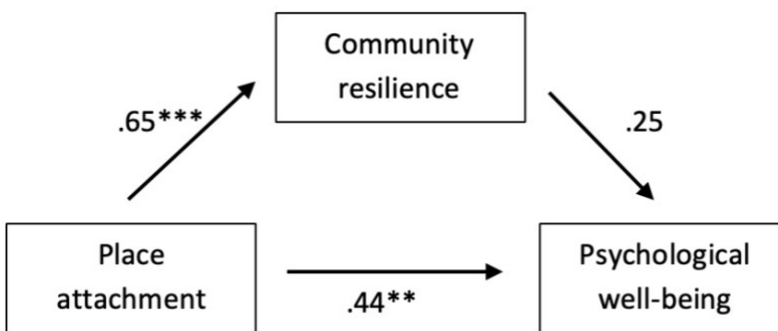
To scrutinise if students' level of PA to the UT campus is positively related to the UT students' PWB (H1), a simple linear model was regressed, which yielded a significant relationship ( $p = .003$ ) between PA and PWB ( $\beta = .44 \pm 0.15$ ). More specifically, students' PWB increased by 0.44 for each 1-point increase in students' PA to the UT campus. Thus, the first hypothesis is accepted. Further, it was tested whether students' PA to campus positively related to their university CR (H2). A significant positive relationship ( $p < .001$ ) was found between the two constructs ( $\beta = .65 \pm 0.09$ ), as the model estimated that the predicted perceived university CR increases by 0.65 for each unit increase in PA. Hence, the second hypothesis is accepted. Moreover, it was assessed whether students' university CR is positively related to their PWB (H3). This third linear regression resulted in a significant positive relationship ( $p < .004$ ) between CR and PWB ( $\beta = .42 \pm 0.14$ ), showing that for each unit increase in CR, PWB rises by 0.42. Thereby, the third hypothesis is accepted too. Furthermore, the main prediction of this paper was that students' perceived CR mediates the relationship between their PA to the UT campus and their PWB (H4). The multiple linear regression (Table 2) showed that the effect of CR on PWB while controlling for PA was not significant. Additional causal mediation analysis showed that approximately 37.13% of the total effect of PA on PWB is mediated by CR, yet the indirect effect of PA on PWB through CR was insignificant ( $p = .16$ ). More specifically, the bootstrapped indirect effect was .16 ( $(.65) * (.25)$ ), and the 95% confidence interval for the bootstrap ranged from -.08 to .46. The total effect of PA on PWB was significant ( $p = .01$ ). Based on these results, the fourth hypothesis is not accepted. An overview of the discussed mediation model can be seen in Figure 1.



**Table 2***Multiple Linear Regression of Relationship Between PA, PWB and CR*

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>	95% CI
Intercept	3.37	0.59	5.76	< .001	[2.2, 4.54]
mean_TCRS	0.25	0.18	1.40	.165	[-0.1, 0.6]
mean_PA	0.28	0.19	1.48	.143	[-0.1, 0.7]

*Note.* CI = confidence interval; *N* = 90.

**Figure 1***Mediation Model Relationships***Additional Analysis**

Three one-way analyses of variance (ANOVA) were performed to determine if there is grouping among the students' PA to campus depending on different categorical variables. To compare the effect of students' nationality status (Dutch vs. international) on their PA to the campus, a one-way ANOVA revealed no significant difference in PA between the two groups ( $F(1, 88) = 0.004, p = .949$ ). Further, it was assessed if a student's living location (UT campus, Enschede, or other) affected their level of PA. However, a one-way ANOVA showed no significant difference between the three groups ( $F(2, 87) = 2.68, p = .074$ ). However, creating one group of people that live on campus or in Enschede (local) and comparing them to the other group via one-way ANOVA yielded a significant difference ( $F(1, 88) = 4.18, p = .044$ ). People not living in the

Enschede area ( $n = 21$ ,  $M_{PA} = 3.5$ ) had an average PA level that was 0.264 lower compared to the local group ( $n = 69$ ,  $M_{PA} = 3.8$ ).

### Open Questions

Students' answers to the optional open question on their PA point out that peer relationships, mostly in the form of friends, seem of significant relevance to feelings of attachment to the UT. Example statements that illustrate this are: "As much as I like the campus, I wouldn't say that I'm really attached to the UT. I feel more attached to the people around me rather than UT itself" or "I feel mostly attached to my friends here, not the UT itself." (Table E1). Moreover, students' elaborations also identified the cognitive aspect of PA in the form of memories as a significant part of their PA. For instance, "I feel very attached to UT because it is where I spend most of my time and where I have made some very strong memories. [...]" or "I feel attached to the people there and fond memories I made with them but not the UT as such (an institution)". Answers also revealed no apparent need to actively maintain a connection with the place (behavioural aspect) (e.g., "[...] I'm not sad to leave"). Concrete expressions of affective aspects of PA were not found (Table E2). A more comprehensive overview of examples from students' answers in relation to their PA can be found in Appendix E.

In relation to the open answers on students' perceived belongingness to the UT community, some participants emphasised the relevancy of social relationships (Table F1). Expressions illustrating this were: "To a great extent, I live on campus, have study friends and take part in the activities. I am also part of multiple associations so I spend a lot of time with the community". Additionally, the students elaborations revealed that university CR is understood in different ways, since comparable CR scores align with significantly different expressions on how the students perceived the university's CR (Table F2): "I dont [*sic*] know, in such events everyone is there [*sic*] own priority at first" ( $M_{CR} = 4$ ), compared to "Yes, I have seen an example of that, especially after the earthquake in Turkey. My friend whose family is in Turkey has received a lot of support, mentally (introduction to psychologist) and legally (being allowed to stay and extend the on-campus housing contract)" ( $M_{CR} = 4.1$ ). Appendix F shows more examples from students' answers illustrating this point.

### Discussion

As the world is dealing with emerging and continuing local as well as global crises (e.g., natural disasters, war, COVID, high-demand society causing stress, mental health challenges), the

well-being of individuals and communities is threatened, which calls for a heightened need for adaptability and resilience. The university student population is one of many populations that show rising levels of mental health problems. Communities have great potential for facilitating adaptation and providing the strength and resources necessary for their members to recover and grow from big and small adversities. Thus, understanding and cultivating resilient university communities is crucial for supporting students' in overcoming hardship and improving their individual well-being. Therefore, the present study aimed to address the literature gap in reference to the resilience of university communities, specifically in the context of PA to campus and PWB among the UT student population. By investigating the interconnection of these three concepts in response to those gaps, this study sought to provide a more sophisticated understanding of the role of university CR in relation to PA and PWB and thereby contribute to improved evidence-based support and facilitation of well-being among university students. Results showed that all three constructs have positive relationships with each other. Further, the study examined whether the perceived university CR of UT students mediates the relationship between their attachment to the UT campus and their PWB. The results indicate that CR does not mediate the relationship between PA and PWB in the university context.

In line with the first hypothesis, the results showed a positive relationship between students' PA to the campus and their PWB. These results were expected, as they are in accordance with previous findings that point towards a multitude of beneficial effects of PA on well-being (e.g., feelings of happiness, relaxation, or life satisfaction) (Billig et al., 2006; Giuliani, 2003; Scannell & Gifford, 2017). Moreover, attachment to a place can satisfy our need for belongingness, especially when the place represents one's social group, which ultimately contributes to well-being (Fletcher, 2015; Scannell & Gifford, 2017). Illustrating this, many students elaborated that they feel attached to the UT campus mainly due to the friends they associate with the place. Supporting this, a cross-sectional study by Reese et al. (2019) first uncovered that the social aspect of a place has greater relevance than its physical features for "people's sense of place" (p.4). Similarly, in a case study, Moghisi et al. (2015) established that social interactions were a significant predictor of PA to the university.

Another finding that gave a deeper insight into the constituents of students' PA to campus was that it appears to be primarily influenced by the cognitive aspect of PA, specifically through memories made at the university. This aligns with the role of cognitive aspects in creating meaning

in a place (Scannell & Gifford, 2010), which is established, among others, via social interactions (Terrazas-Carrillo et al., 2014). This makes sense given the previously elaborated significance of social ties for students feeling of PA to campus. Relatedly, some student answers revealed an indifference towards leaving the UT, indicating that even though universities can have a certain significance for students since they relate to major transition periods (Pereira et al., 2020), they usually do not represent a long-term place to stay for students. Supporting this, in her master's thesis, Polfliet (2020) reported that Dutch students recognised the importance of their university city for their academic and student lives but also anticipated moving after graduation. Additionally, studies have reported the lowest levels of PA in American first-year students and a decline in attachment in the final year of the four-year study period (Qingjiu & Maliki, 2013), possibly due to preparations to leave the place. Notably, in the Netherlands, a bachelor's degree takes only three years, which is even a shorter amount of time in general to develop an attachment. In summary, the study suggests that cognitive aspects, such as memories, are more relevant to students' PA to the university campus, considering that these places are not anticipated to be permanent. Thus, the lack of behavioural and affective aspects could mean that PA manifests differently in relation to attachment to the campus.

Additionally, the study found no difference in PA between national and international students, contradicting the claims of Qingjiu and Maliki (2013). However, a significant difference was observed based on students' living locations and their levels of PA to the campus. This suggests that in this study population, living location appears more influential in the development of students' PA than factors related to nationality. This could be attributed to the high international student population at the UT (approximately 30%) (UT, n.d.): being international is common, and students can find others with similar experiences or even from the same nationality, which could contribute to forming relationships more easily and diminish the impact of nationality on PA development compared to previously investigated contexts.

Further, this study found a strong positive relationship between PA to campus and university CR, supporting the second hypothesis and aligning with existing evidence that revealed the significance of PA towards the establishment and mobilisation of CR (Berkes & Ross, 2013; Faulkner et al., 2018; Indayani et al., 2021). These results quantitatively support Faulkner et al.'s (2018) qualitative study, emphasising the fundamental role of PA as a foundation for CR since other factors important for CR, such as community networks, build on it. Furthermore, the third

hypothesis was confirmed, revealing a positive association between students' perceived university CR and their PWB. Drawing on the conceptualisation of CR that emphasises the potential of resilient communities to recover and overcome adversity and support people's well-being (Ungar, 2011b), a significant influence of CR on individual well-being was expected and is consistent with previous literature (Cénat et al., 2021; Mental Health Foundation, 2013; Murray & Zautra, 2011). Remarkably, the importance of peer relationships in fostering a feeling of being part of the UT community was highlighted by a significant number of students in this sample. This importance aligns with the role of strong relationality and belonging as components of CR that can have a substantial impact on individual well-being (Quinn et al., 2020). Interestingly, Indayani et al. (2021) found that in their Indonesian sample, PA and CR are mainly shaped by "social aspects" (p. 6), which is also reflected in the findings of this study as students pointed towards the relevance of their peer relationship in reference to PA and their belongings to the UT community.

Furthermore, contrary to the hypothesised association, the results revealed that university CR does not mediate the relationship between students' PA to campus and their PWB. Prior to the following discussion, it should be pointed out that the possibility exists that the effect of PA on PWB through CR is not strong enough to be detected in the current sample but that it still exists in reality. In this case, rejecting the hypothesis would be a type II error. Nevertheless, the following discussion assumes that the mediation effect does not exist in the study context of UT students. Hence, the results suggest that the relationship between students' PA and their PWB is direct and not mediated by CR.

Furthermore, this unexpected finding could reveal that the relationship between students' PA, university CR, and their PWB might be more complex than a simple mediation model can capture. For instance, it is widely acknowledged that well-being is a highly complex construct that interacts with a multitude of factors, including physical health, personality factors, age, stress, or self-esteem, to name a few (Campbell et al., 2022; Huppert, 2009; Ozpolat et al., 2012). Considering this, there may be other variables interacting, for example, with CR to affect PWB, and ignoring those variables could lead to a failure to detect significant mediation effects. For instance, Raich et al. (2017) showed that in the context of natural disasters, the response of a community, its confidence in its own resilience strategies, and its trust in the authorities to provide public health services are heavily influenced by cultural factors. Such cultural factors could similarly influence the way CR relates to PWB in the context of social, health, or other adversities.

In this light, it is relevant to consider that the 90 students in this heterogeneous sample had 24 different nationalities. It could be that each nationality has a different understanding of CR practices, which might not be reflected in the UT-based resilience practices and could have affected the perceived CR and its relationship to the other variables.

Additionally, it is important to mention that previous studies have shown that a student's year of study can impact their PA (Polfliet, 2020; Qingjiu & Maliki, 2013). The study population included people in all three bachelor's years and one to two master's years, which reflects a heterogeneity in the sample that was not taken into account during the analysis. Arising potential differences among the students' PA could differently affect their perceived CR and their PWB and, therefore, affect the proposed model and results. Moreover, it could also be that the relationship between CR and well-being is not as one-directional as assumed and that well-being also influences CR. For instance, poor mental health has been linked to social isolation or strained relationships (Elmer & Stadtfeld, 2020; Tulane University, 2021), which might impact or may be impacted by access to the community and its resilient potential. This could mean that the relationship between PWB and CR is more bidirectional, which could explain the non-significant mediation results.

Further reasons for the insignificant mediation effect relate to epistemological issues. Firstly, investigating the answers to the open questions on university CR revealed that the concept was understood and interpreted in many different ways by different students. While some believed that the UT community has the resources to overcome hardship, others clearly stated their mistrust in the provision of such resources. Strikingly, however, their mean scores of CR were relatively similar. The fact that these differences were not reflected in the scores could be because many students define the UT community as their friend group, as discussed earlier. In terms of resources, friends, however, are on a very different level compared to an institution such as the UT. Hence, this points out that, at least for some students, the same levels of CR did not accurately reflect the differences in the definition of this concept, which includes not only social aspects but also physical infrastructure (Ungar, 2011b). Similarly, another epistemological issue that could have arisen is that the measurement of PA to campus among students might be dependent on the literal physical environment. More specifically, being physically present on campus while filling out the survey might have caused the individual's PA to be more salient, while not being on campus could have the opposite effect.

Even though university CR does not mediate the relationship between students' PA to campus and their PWB, this study still revealed relevant insights into the three constructs in the university context and the relationships between them. To start with, the results confirm that PA can exist among the UT students despite increased mobility and multiple places to live, which are prominent in the student population, and which supports previous literature (Gustafson, 2009a; Gustafson, 2009b; Gustafson, 2013; Kelly & Hosking, 2008; Scannell & Gifford, 2014; Van Patten & Williams, 2008). Further, considering the significant relation of students' PA to their PWB, reflecting the numerous psychological advantages that have been linked to PA, including belonging, security, and happiness (Giuliani, 2003; Scannell & Gifford, 2017), these results are relevant to supporting students' mental health in more sophisticated ways. More specifically, the study points out that cognitive aspects such as memories (compared to affective or behavioural aspects) as well as their peers seem to have great significance for the students' PA to the UT campus. Considering that the former might relate to the fact that a university is usually an inherently temporal place, these findings could apply to student populations in general and provide a new insight into what constitutes PA among students. Therefore, to facilitate those aspects and positively impact students' well-being and CR, universities could offer planned social activities such as day trips, workshops, or socio-cultural offers (e.g., theatre or dance classes) that actively create room for memories and peer interactions.

Along similar lines, the significance of PA in relation to university CR underlines the potential resilient universities could have when actively investing in fostering PA among their students. Resilient communities hold great potential to help their members adapt to and recover from adversity and thereby promote their well-being (Cénat et al., 2021; Mental Health Foundation, 2013; Murray & Zautra, 2011; Quinn et al., 2020; Ungar, 2011b). As PA appears important for community resilience and considering that the social aspect is of heightened relevance among students for PA, universities should consider this during campus planning. More specifically, creating spaces that invite students to spend time on campus and/or together can be helpful, such as well-maintained facilities, green spaces, and multiple student-gathering areas (e.g., shared eating or study places, association rooms, etc.). This might not only be helpful to provide the fundamental conditions for PA as a basis for CR but also to allow relevant constituents of students' campus PA to manifest more thoroughly. Thereby, the university might create an additional incentive for students to spend time on campus, potentially increasing the chance of

significant relationships and memories being formed.

Moreover, the study provides evidence that CR relates to student well-being. Given the prevalence of mental health issues among UT students and the need for reaction that has been pointed out (Kelders et al., 2019), it is relevant for UT to consider these findings for improving students' well-being. Despite well-being not being a concern in this specific sample, the rise of mental health problems, such as anxiety, poses a threat to students' well-being on a larger scale (Kelders et al., 2019; National Institute for Public Health and the Environment, 2021; Pereira et al., 2020). Therefore, it is crucial for the UT and other universities to actively promote resilience through resilience education and training on a community level, for instance, with the help of workshops or informational materials. Next to that, universities need to create the infrastructure and resources that members can avail themselves of to overcome hardship, adapt, and recover. This includes establishing mental health services, trust persons, and intermediary structures to help people access available resources. Additionally, universities should ensure easy and open access to these resources by actively informing their members about their availability (e.g., through posters, emails, etc.).

### **Limitations and Future Recommendations**

After the previous discussion concerning interpretation and implications, it is important to shed light on the limitations of this study and consider them while interpreting the results. Firstly, the sample size is relatively small, which makes generalizability to student populations in general very difficult. Furthermore, the small sample could have led to insufficient variance to find a mediation effect and limited the statistical power. Hence, future research should investigate the interrelationships of PA, CR, and PWB in larger samples of university student populations. Further, because different campus structures (e.g., one large area vs. distributed over a city) could differently affect PA in the university context and, hence, its relation to PWB and CR, cross-university samples should be investigated in the future to assess if the relationships hold across different contexts and, if not, what differentiates them.

Another limitation regards the minimised representability of this study's sample due to sampling bias as participants were recruited via convenience and snowball sampling. Most participants in this study were approached in person on campus. This could have led to a potential bias as those individuals who were already present on campus may have higher PA scores compared to the overall population of students. Therefore, the PA scores obtained from this sample



might not accurately represent the PA levels of the entire student population. Hence, accounting for those differences or using random sampling procedures is strongly recommended for future studies, especially if the sample size is limited. Similarly, to better understand the complex relationships among the variables, especially in relation to individual well-being, it may be necessary to explore alternative and more complex models that might have moderation effects or consider multiple mediators simultaneously. Heterogeneous factors in the sample, such as different nationalities with different understandings of what constitutes resilience communities and different levels of study that impact students PA, should be included or controlled for in future studies. By taking a more nuanced approach in a more representative sample, a clearer picture of the relationships between PA, CR, and PWB and a better understanding of the effects of potential variations among the sample can be obtained, thereby ultimately contributing to better evidence-based insight in how to facilitate each of these factors among students.

Moreover, it needs to be considered that the assumption of homoscedasticity in the mediation model was not met, which might indicate that the relationship between the examined variables is not as straightforward or predictable as assumed. It indicates that relationships between PA, CR, and PWB in the mediation model may vary depending on different variable values. Thus, caution should be exercised while interpreting the results, as this suggests that there may be other influences that are affecting the relationship. This similarly suggests scrutinising more complex models in reference to students' PA, CR, and their PWB.

Additionally, it needs to be noted that the analysis undertaken cannot assess causality, as cross-sectional studies only provide a snapshot of a specific point in time. Hence, representative panel studies of student cohorts over longer time periods are advisable in the future to get more insight into the one-or bi-directional character of the relationship between CR and PWB but also between PA and CR. This will contribute to a more comprehensive assessment of the complex interactions and can ultimately inform universities and their practices to support their students and resilient university communities.

Lastly, it is noteworthy that the open questions in this study uncovered a more nuanced picture of what constitutes students' sense of belonging to the community, their perception of the university's CR, and their understanding of PA. However, only some of the participants answered those questions, and they were also not the focus of this analysis. Since the answers given already revealed relevant insights (e.g., the importance of cognitive aspects of PA) and indicated a

diversity that seemed not to be accurately reflected in scale scores, future qualitative and mixed-methods research is necessary to confirm these findings. This would greatly enrich our insight into those concepts among students and ultimately help to learn more about their needs and facilitate better support strategies to positively impact their well-being.

### **Conclusion**

Concludingly, to my knowledge, this quantitative cross-sectional study was the first investigation of the interrelation of PA, CR, and PWB among university students. Thereby, this study represents a starting point for developing a comprehensive, evidence-based understanding of CR in the context of university life and student well-being. While this study gave important new insights into how students' PA, their perceived CR, and their PWB are manifested and related, it also revealed new questions. Future research needs to address those questions and invest in examining the interrelations that come together to influence resilient university communities in the context of students' attachment to campus and their PWB.

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## Appendix A

### Transcultural Community Resilience Scale

We all belong to communities we identify with on different levels and the first scale of the survey concerns the University of Twente (UT) community. The UT community includes students and student groups (e.g., study associations, sport/cultural associations, activist groups, student report) and also institutional staff (e.g., teachers, study advisors, student services, doctors). Please think of the UT community and rate the following statement according to how much you agree or disagree with them:

*Totally disagree – disagree – neither agree/disagree – agree – totally agree*

<-----1-----2-----3-----4-----5----->

1. If anything were to happen to me, I know I could count on my university community.
2. In the event of a catastrophic event (natural disaster, war, etc.), I know that I could count on my university community to cope with the event and move forward.
3. When I go through hard times, there are people in my university community I can talk to.
4. The relationships I maintain in my university community help me cope with problems that happen to me or that may happen.
5. One of my strengths when facing adversity is knowing that I can count on one or more members of my university community.
6. The members of my university community know they can count on me when problems arise.
7. I am willing to help members of my university community who are facing difficulties.
8. I get involved in activities in my university community.
9. My cultural traditions and spiritual and/or religious and/or my values help me cope with difficulties.
10. Activities in my university community help me create bonds with people.
11. My university community helps me adapt in the event of important life changes or difficulties.
12. Being able to count on my university community in the event of difficulties is very reassuring to me.
13. In my university community, we always find a way to laugh and distract ourselves, even in difficult times.
14. In my university community, there is at least one person who can help me find concrete solutions when I face difficulties.
15. When I go through difficult times, there are institutions in my university community and/or my city that are there to help me.
16. If I were to fall ill, I know that I can turn to the healthcare institutions of the University of Twente (the campus doctor's offices) to receive the adequate care.
17. I trust the health care staff at the University of Twente (the staff members of the doctor's offices) to provide me with adequate care.
18. I trust the social services available in my university community.
19. I have enough information to know which university institutions to turn to in the event of difficulties.
20. In my university community, there are strong traditions of mutual support.

21. My university community makes efforts to integrate all its members and make them stronger.
22. My university community enables its different members to build strong bonds with each other.
23. Mutual support is one of the values held by my university community.
24. In my university community, sharing is a very important value.
25. I am proud to be a member of my university community.
26. I share the values of my university community.
27. Participating in my university community's activities is important to me.
28. I feel connected to my university community and to its values.

## Appendix B

### Psychological Place Attachment Scale

Often people have strong feelings toward a particular place, such as their school, places they have visited before, or even places they have never been to. Below are statements concerning your feelings toward the University of Twente (UT) as a place. Throughout the following statements, with "UT" we mean the campus including, for example, parks, lakes and all buildings of the UT (including study areas, library, dining areas etc.). There are no right or wrong answers. Please rate the following statement using the scale below:

*Strongly disagree – disagree – neither agree/disagree – agree – strongly agree*

<-----1-----2-----3-----4-----5----->

1. I feel happy when I am at the UT.
2. I expect to have significant memories of the UT after I leave.
3. I don't care about what happens at UT. R
4. I feel secure when I am at the UT.
5. The UT has a special meaning for me.
6. I keep up with the news about the UT no matter where I am.
7. I would not feel sad if I had to leave the UT. R
8. I don't feel I belong to the UT. R
9. I like the UT.
10. I will forget about the UT if I move away. R
11. The UT is not a comfortable place for me. R
12. The UT seems unfamiliar to me. R
13. I feel relaxed at the UT.

## Appendix C

### Psychological Well-being Scale

Please rate the following statement according to how much you agree or disagree with them. There are no right or wrong answers.

strongly agree - somewhat agree - a little agree - neither agree/disagree - a little disagree - somewhat disagree - strongly disagree  
 <-----1-----2-----3-----4-----5-----6-----7----->

1. I like most parts of my personality. R
2. When I look at the story of my life, I am pleased with how things have turned out so far. R
3. Some people wander aimlessly through life, but I am not one of them. R
4. The demands of everyday life often get me down.
5. In many ways I feel disappointed about my achievements in life.
6. Maintaining close relationships has been difficult and frustrating for me.
7. I live life one day at a time and don't really think about the future.
8. In general, I feel I am in charge of the situation in which I live. R
9. I am good at managing the responsibilities of daily life. R
10. I sometimes feel as if I've done all there is to do in life.
11. For me, life has been a continuous process of learning, changing, and growth. R
12. I think it is important to have new experiences that challenge how I think about myself and the world. R
13. People would describe me as a giving person, willing to share my time with others. R
14. I gave up trying to make big improvements or changes in my life a long time ago.
15. I tend to be influenced by people with strong opinions.
16. I have not experienced many warm and trusting relationships with others.
17. I have confidence in my own opinions, even if they are different from the way most other people think. R
18. I judge myself by what I think is important, not by the values of what others think is Important. R

#### **Subscales**

- Autonomy (Q15, Q17, Q18)
- Environmental Mastery (Q4, Q8, Q9)
- Personal Growth (Q11, Q12, Q14)
- Positive Relations with Others (Q6, Q13, 16)
- Purpose in Life (Q3, Q7, Q10).
- Self-acceptance (Q1, Q2, Q5)

## Appendix D

### Complete Survey Flow

#### Start of Block: Research Introduction and Informed consent

Dear participant,

With our study we want to extend our understanding of community resilience, by conducting a survey on the perceived community resilience of students at the University of Twente (UT) and related concepts. We therefore kindly ask you to fill out the survey only if you are a student at the UT.

Community resilience can be seen as the support one receives from the people and institutions around them, to deal with and overcome negative events in order to enable returning to one's normal life.

In our efforts to expand the theoretical background of community resilience, we introduced four concepts into this context. The four concepts are *place-attachment*, *self-efficacy*, *well-being* and *uncertainty*, which will all respectively be measured.

We appreciate your time and effort to participate in our study in an honest way,

Alexander Langermann,  
Ann Ottil,  
Sophie Hetche.

---

#### Informed consent

Before you continue, we would like you to **carefully read** the following consent form and **answer** according to your preference.

You have read and understood the study information and understand the study involves completing several questionnaires. This will take you approximately 30 min. Your participation in this study is entirely voluntary and you are free to withdraw from the study at any time without consequences or giving any reason.

Further, it is clear to you that:

- Your data will be used for the Bachelor theses of the three researchers named above.
- All the data that is generated when you complete this survey (e.g., demographics and scale answers) will be treated confidential, stored adequately, and will not be used to try to identify you.
- Should you withdraw from the study, your data will be permanently deleted.
- Your data that was generated through this survey can be archived and used for future research.

If you have any questions or concern or decide to cancel your participation after you completed the questionnaire, the researchers can be contacted via one of the following email addresses:

xxx

—

Have you understood the provided information and consent to take part in this study? Please tick the appropriate box.

- Yes
- No

→ Skip To: End of Survey If Informed consent Before you continue, we would like you to carefully read the following consent f... = No

### **End of Block: Research Introduction and Informed consent**

—

### **Start of Block: Demographics**

Before the survey starts, please fill out your demographic information.

How old are you?

▼ 18 ... 6

—

What gender do you identify as?

- female
- male
- other, please specify \_\_\_\_\_
- prefer not to say

—

What is your country of origin?

▼ Afghanistan ... Zambia

—

Where do you currently live?

- UT campus
- Enschede
- Other, please specify \_\_\_\_\_

—

Since which year are you living there?

▼ 1963 ... 2023

→ Display This Question: If “Where do you currently live?” != UT campus

How often are you at the UT within one week?

- 2 times or less
- up to 3 times
- up to 6 times
- everyday

—

In what year of your studies are you?

- Bachelor year 1
  - Bachelor year 2
  - Bachelor year 3
  - Master year 1
  - Master year 2
  - other (please indicate either Bachelor, Master, PhD, and year)
- 

—

What do you study?

▼ University College Twente (Atlas) ... Other

—

How did you learn about this survey?

- Sona website
- I was asked to participate in person.
- I was asked to participate over text (ex. through a group message).
- Social media
- other, please specify \_\_\_\_\_

Thank you for providing us with your demographic information. You will now proceed with the main part of this survey. It consist of several questionnaires and optional open questions. Please make sure to read the statements and tables carefully, as their layouts differ. We also want to remind you that there are no right or wrong answers.

**End of Block: Demographics**



---

**Start of Block: Community Resilience**

We all belong to communities we identify with on different levels and the first scale of the survey concerns the University of Twente (UT) community. The UT community includes students and student groups (e.g., study associations, sport/cultural associations, activist groups, student report) and also institutional staff (e.g., teachers, study advisors, student services, doctors). Please think of the UT community and rate the following statement according to how much you agree or disagree with them:

**TCR-S including attention check item**

---

How much do you feel part of the UT community and why? Please answer briefly.

---

Do you think the UT community has the strengths and resources to overcome crises (e.g., a pandemic) and recover from them? Why or why not do you think so? Please answer briefly.

**End of Block: Community Resilience**

---

**Start of Block: Place Attachment**

You now move on to the next scale. Often people have strong feelings toward a particular place, such as their school, places they have visited before, or even places they have never been to. Below are statements concerning your feelings toward the **University of Twente (UT) as a place**. Throughout the following statements, with "UT" we mean the campus including, for example, parks, lakes and all buildings of the UT (including study areas, library, dining areas etc.). There are no right or wrong answers. Please rate the following statement using the scale below:

**PPAS-SF**

---

How much do you feel attached to the UT and why? Please answer briefly.

**End of Block: Place Attachment**

---

**Start of Block: psychological well-being**

You now move on to the next scale. Please rate the following statement according to how much you agree or disagree with them. There are no right or wrong answers.

**PWB-S (including attention check item)**

**End of Block: psychological well-being**

---

**Start of Block: Self efficacy**

You now move on to the next scale about **self-efficacy**. A general sense of perceived self-efficacy is the belief that you can perform tasks, overcome challenges and cope with stressful life events. Please indicate how much the following items apply to yourself:

### General self-efficacy scale

**End of Block: Self efficacy**

---

**Start of Block: Uncertainty**

Did you study at the University of Twente at **any time** when covid measures were implemented (12.3.2020- 25.2.2022)?

- No
- Yes

→ Display This Question: If "Did you study at the University of Twente at any time when covid measures were implemented (12.3..." = Yes

---

You now move on to the next scale. Here, we would like to know how you experienced the covid pandemic. Please fill in this scale while keeping in mind how you felt **during the time that covid measures were implemented** at the University of Twente. The first measure was implemented at the 12.3.2020 and the last restriction concerning educational activities was lifted on the 25.2.2022.

Below, with "characteristic" is meant how much this statement applies to you. For example, "1 (not at all characteristic)" means that this statement does not apply to you at all.

### Intolerance of uncertainty scale

→ Display This Question: If "Did you study at the University of Twente at any time when covid measures were implemented (12.3..." = Yes

---

If you felt uncertain during covid, what did make you feel uncertain and why? Please answer briefly.

---

→ Display This Question: If "Did you study at the University of Twente at any time when covid measures were implemented (12.3..." = No

---

We now ask you to fill in the next scale. While filling in this scale, please keep in mind how you felt **during the last month**.

Please keep in mind that "characteristic" means how much this statement applies to you. For example, "1 (not at all characteristic)" means that this statement does not apply to you at all.

### Intolerance of uncertainty scale

→ Display This Question: If “Did you study at the University of Twente at any time when covid measures were implemented (12.3...” = No

—

If you feel uncertain at the moment, what makes you feel this way and why? Please answer briefly.

**End of Block: Uncertainty**

**Appendix E**  
**Open Answers PA**

**Table E1**

*Examples From Student's Emphasis on Peer Relationship in Their PA to Campus*

<i>M<sub>PA</sub></i>	<i>Open question answer to PA</i>
3.8	I feel mostly attached to my friends here, not the UT itself.
4.3	As much as I like the campus, I wouldn't say that I'm really attached to the UT. I feel more attached to the people around me rather than UT itself.
3.9	I feel pretty attached to the UT, since I made a lot of friends and participated in fun activities
4.2	a lot, most of my friends go to the UT, and i spend most of my time and energy on the UT
3.8	Not much, but I like my friends here.
3.8	The UT itselfs [ <i>sic</i> ] is not really important to me, the people whom I like to speak make it a nice place for me
3.5	I do feel very attached to the UT because I have very close friends living next to me. They make me feel very safe, but when I am without them this feels very different.
3.1	I don't feel like that I am attached to the UT because most of my uni friends live in Germany and I often drive back home which is why I don't feel too attached to the UT. But it is cool to be here and spend some time here with my friends.
3.9	Very attached, mainly because I know a lot of people here.

**Table E2***Examples From Student's Elaborations on Cognitive and Behavioural Aspect of PA*

<i>PA component</i>	<i>M<sub>PA</sub></i>	<i>Open Answers to how Attached Students Feel and why</i>
behavioural	4.3	I really like the UT and feel attached to some extent due to the numerous group projects I had in many of the campus' buildings. However, I would not actively ruminate about missing the University as I am ready to move to a university in a larger city.
behavioural	4.5	I feel attached to the UT because I like the campus and the people around me, but if I had leave to another good university, I would not be sad, so I like it here but I am also open to getting to know new places.
cognitive and behavioural	3.2	I like places I visit regularly but have no strong attachment to it. They are part of my memories but leaving would not make me sad.
cognitive and behavioural	3.3	I feel attached to the ut in a way, that I studied there for 3 years and of course made some memories there. However, I would prefer to do my master elsewhere and I'm not sad to leave the ut
behavioural	2.8	I am not really attached to the UT as I am not really part of any of its associations. I just study there and once that is done I will move on. Nevertheless I like the place and connect positive things with it.
behavioural	3.8	i like the UT and the experiences i have made her, i would choose to go here again, nevertheless i am also happy to discover another university for my masters for example
behavioural	3.3	I feel attached to the ut in a way, that I studied there for 3 years and of course made some memories there. However, I would prefer to do my master elsewhere and I'm not sad to leave the ut
cognitive	3.9	Quite attached since this is the place where i met my best friends and hung out with them frequently, i have a lot of good memories about the place.
cognitive	3.7	I feel attached to the people there and fond memories I made with them but not the UT as such (an institution)
cognitive	3.5	I feel attached to the memories and people I met. Not the actual physical UT.
cognitive	3.7	i like the UT and i do have good memories of classes, friends, festivals so I feel grateful for that. However, i think I am not that attached to the UT as like i said, do not have a strong community and strong ties here and i am also ready to move on to something new.
cognitive	4.4	I feel very attached to UT because it is where I spend most of my time and where I have made some very strong memories. During the week I am at UT most of the time to study, go to lectures, have meetings, but at the same time I can meet my friends, eat and drink coffee with them and have fun.
cognitive	2.9	In a way a lot, since I made a lot of memories here, but I never feel the need to defend UT
cognitive	4.6	Quite attached as it is not only a place to study to me, but also one where I see friends and made lots of good memories

**Appendix F**  
**Open Answers CR**

**Table F1**

*Examples From Students Elaborations on What Constitutes Their Community Feeling*

<i>M<sub>CR</sub></i>	<i>How Much Students Feel Part of the Community and Why</i>
4	To a great extent, I live on campus, have study friends and take part in the activities. I am also part of multiple associations so I spend a lot of time with the community.
3.5	I do very much feel part of my friend group that consists of people from my studies. next to that i feel very safe and part of my sports association.
3.4	I feel moderately as part of the UT community through the study associations i volunteer for and the events that take place from the UT community in general.
3.9	I feel part of the UT community on an important level. Although I am not an active member of any student or study association, I believe that UT is a place where I can feel safe, seek help and support when I am struggling, create bonds, and connect with others, which is very important to make the study experience more enjoyable.
4	I gained many good friends in a uni context
3.5	Only slightly. I'm not part of any student association or so. Nevertheless I found good friends at university who I count as my ut community. Also, I take part in the thesis support group.

**Table F2***Students' Perception of the UT Ability to Provide Resources and Overcome Hardship*

<i>M<sub>CR</sub></i>	<i>UT has Resources</i>	<i>UT has no Resources</i>
3.5		No I do not think so, I think the UT values its name and reputation too much to make important decisions.
3.4		I would say no, because when I first moved here in 2021 when covid was still present, their response was not helpful and the updates were in no way supportive, therefore i would say they do not respond to change well and do not come up with optimal solutions to overcome them or recover from them.
3.9		Although I believe that UT has the strengths and resources to overcome crises, there is still room for improvement in the way these resources are utilized. This is based on my personal experience of studying at UT during the pandemic.
4		I dont [ <i>sic</i> ] know, in such events everyone is there [ <i>sic</i> ] own priority at first
3.4		I think that we do and we dont [ <i>sic</i> ]. For people who bounce back a little it is fine and there are a lot of things to help them bounce back further. But for people who dont [ <i>sic</i> ] bounce back a little, they get lost and no one helps them.
3.3	yes do think so. The covid crisis was handled fine, and the ut provided support if needed. It was made clear in emails where to find support.	
4	Yes, I have seen an example of that, especially after the earthquake in Turkey. My friend whose family is in Turkey has received a lot of supports, mentally (introduction to psychologist) and legally (being allowed to stay and extend the on-campus housing contract)	
3.7	I think they have the strengths to overcome crisis, since they already did this during Covid.	
3.3	Yeah, I definitely think so (see Covid pandemic). The university is very well prepared and can act really fast, at least from what I experienced. That is why I believe in the university to overcome hard times.	