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To cite this article: Christopher D. Slaten, Zachary M. Elison, Eric D. Deemer, Hayley A. Hughes & Daniel A. Shemwell (2017): The Development and Validation of the University Belonging Questionnaire, The Journal of Experimental Education, DOI: [10.1080/00220973.2017.1339009](https://doi.org/10.1080/00220973.2017.1339009)

To link to this article: <http://dx.doi.org/10.1080/00220973.2017.1339009>



Published online: 23 Jun 2017.



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## The Development and Validation of the University Belonging Questionnaire

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### ABSTRACT

Although belonging in K–12 school settings has been abundantly researched and clearly defined, at the university level the research and construct definition is still in its infancy (Tovar & Simon, 2010). The present study sought to develop and validate an instrument measuring university belonging—the University Belonging Questionnaire (UBQ). In Study 1, an exploratory factor analysis was conducted with a sample of university students ( $N = 421$ ), finding a reliable scale with three factors: (a) university affiliation, (b) university support and acceptance, and (c) faculty and staff relations. In Study 2, a confirmatory factor analysis on a new sample ( $N = 290$ ), confirmed the final 3-factor, 24-item model. Further analyses demonstrated the convergent and incremental validity of the UBQ, as it positively correlated with measures of perceived social support, social connectedness, and general belonging. Implications and recommendations for university belonging research are discussed.

### KEYWORDS

Academic belonging; measurement; school belonging; social connectedness; university belonging

BELONGING IN ACADEMIC settings has been extensively researched at the K–12 school level, where scholars have demonstrated the salience of the construct, influencing a multitude of academic and psychosocial outcomes. Specifically, researchers have found that having a sense of belonging to one's school is associated with higher grades (Pittman & Richmond, 2007), valuing school work (Anderman, 2003; Goodenow & Grady, 1993), school enjoyment, academic effort (Goodenow & Grady, 1993; Sánchez, Colón, & Esparza, 2005), persistence (Goodenow & Grady, 1993), achievement motivation (Ibañez, Kuperminc, Jurkovic, & Perilla, 2004), self-efficacy (McMahon, Wernsman, & Rose, 2009), psychological well-being (Baskin, Wampold, Quintana, & Enright, 2010; Slaten & Baskin, 2014), attendance (Sánchez et al., 2005), and social acceptance (Freeman, Anderman, & Jensen, 2007). Conversely, students who lack a sense of belonging to their school may be at increased risk of dropping out. From this line of research, it is abundantly clear that school belonging is a powerful construct that impacts youth.

Although the school-belonging literature at the K–12 level is vast and demonstrates the importance of the construct, researching the experience of belonging for university students is still in its infancy. This paucity of research is surprising given the fact that many scholars in educational and psychological disciplines have argued for its importance (Hurtado & Carter, 1997; Hausmann, Schofield, & Woods, 2007; Pittman & Richmond, 2008; Tinto, 1987; Wang, Wei, & Chen, 2015). These scholars argue that a sense of belonging is an implicit component of Tinto's (1987) theory about student persistence and retention. Hausmann et al. (2007) stated that the "sense of belonging is most often implied as the result of social and academic integration, rather than specified and measured as an independent construct" (p. 806). Both Hausmann et al. (2007) and Hurtado and Carter (1997) argue that university

belonging is significantly under-studied at the collegiate level, particularly as it pertains to student retention and persistence. Some researchers believe belonging can be subsumed in other measures of university persistence. However, the work of Nora and Cabrera (1993) demonstrates that belonging is indeed an independent construct impacting persistence and commitment at the university level; thus, providing justification for studying belonging as an independent factor on student persistence is uniquely crucial.

At the postsecondary level, the research regarding university belonging is rather sporadic and inconsistent across disciplines and peer-reviewed journals. The largest issue in this line of work is the lack of a valid and reliable standardized scale to measure the belongingness construct. Researchers continue to either attempt to adapt a scale (e.g., Freeman et al., 2007; Pittman & Richmond, 2008; Wilson et al., 2015; Zumbunn, McKim, Buhs, & Hawley, 2014) that was originally validated on a noncollege student population (e.g., Psychological Sense of School Membership [PSSM], Goodenow, 1993) or to create an ad hoc scale for their study (e.g., Booker, 2007; Nunez, 2009; Shook & Clay, 2012). While these researchers often provide a rationale for such measurement choices, including preliminary evidence of reliability and basic validity, questions remain as to the level of confidence that these scales are actually measuring the construct of university belonging. Guidelines of scale development note the importance of the iterative process associated with defining and operationalizing a construct, including generating a broad item pool, performing exploratory and confirmatory analyses in identifying the scale factor(s), and providing ample evidence for its construct validity (Clark & Watson, 1995; Dawis, 1987; Miles, Mallinckrodt, & Recabarren, 2016; Worthington & Whittaker, 2006). Researchers adapting a scale originally developed for K–12 students (e.g., PSSM, Goodenow, 1993) operate under the assumption that K–12 school belonging comprises the same conceptual domains as university belonging. By bypassing the standardized recommendations for scale development, both researchers and their readers lose the confidence associated with using empirically supported scales (Clark & Watson, 1995; Worthington & Whittaker, 2006). In addition to the problems with validity, the use of adaptive and ad hoc scales also makes it difficult to compare results across studies, as scales often drastically vary in length, domains measured, and wording.

Complicating matters further, scholars have used a variety of terms to essentially conduct research on similar constructs: belonging (Baumeister & Leary, 1995; Pittman & Richmond, 2008), relatedness (Josselson, 1995), and social connectedness (Lee & Robbins, 1995). All of these constructs target a similar concept of understanding how students feel in relation to their respective university campuses. In sum, the research on belonging in university settings has utilized various theories, different constructs, and varying definitions to discuss essentially the same thing: university belonging. We believe that these theories, constructs, and definitions, taken collectively, along with newer research on college student perspectives on belonging (Slaten et al., 2014; Slaten et al., 2016) will allow researchers to measure a uniform and well-defined construct. The current study provides the development of a new scale, the University Belonging Questionnaire (UBQ), in an attempt to more accurately and completely measure the construct and to provide a universal measure to be used by scholars across research studies and disciplines.

## Theory of belonging

The construct of belonging at the university level draws from various theoretical lenses to conceptualize belonging as a framework in higher education (Baumeister & Leary, 1995; Ryan & Deci, 2002; Tinto, 1987). For the purposes of the current study, our team utilized the work of Maslow (1954) and Baumeister and Leary (1995) as a theoretical lens, along with previous qualitative research on university belonging (e.g., Slaten et al., 2013). The theory of belonging originated from the work of Abraham Maslow (1954) as he identified his infamous hierarchy of needs. He labeled one of these needs “love and belonging,” stating that human beings naturally have a strong desire for affectionate relationships and to be a part of a group or network. Maslow (1954) believed that this desire was a fundamental need for all human beings. Baumeister and Leary (1995) expanded on the construct of belonging, affirming that belonging was a fundamental need that was distinct from other social behavior variables

such as “influence” or “support.” They defined belonging as a perceived experience of consistent interaction and persistent caring from others (Baumeister & Leary, 1995). Both Baumeister and Leary (1995) and Maslow (1954) emphasize that the experience of belonging must exist in order for an individual to have a strong desire for knowledge or understanding. Thus, the experience of academic belonging in particular can be salient for individuals, suggesting theoretically that those who do not experience a sense of belonging in school settings will have a more difficult time learning in school compared to their same-age peers.

## Measuring university belonging

Among the few empirical studies that have been completed on university belonging, researchers have been creative in how they have attempted to measure the construct. Because the literature is lacking a clearly defined, reliable, and valid measure, scholars have elected to create their own measures of school belonging or utilize scales originally designed for middle school students (e.g., PSSM; Goodenow 1993). Adaptations were accomplished by rephrasing certain words on items utilizing university vernacular such as “professor” in place of “teacher” (e.g., Freeman et al., 2007; Pittman & Richmond, 2007, 2008; Wilson & Gore, 2013). Other scholars used subscales of university persistence measures, selecting items that mention belonging, that were not originally designed to be an independent measure of belonging (e.g., Hausmann et al., 2007; Hausmann, Ye, Schofield, & Woods, 2009; Strayhorn, 2008). Finally, a few other scholars chose to develop their own measure for their study prior to piloting the scale and examining it for reliability and validity (e.g., Johnson et al., 2007). Johnson et al.’s (2007) study examined a scale developed based on the work of Hurtado and Carter (1997) and created items for a belonging scale for their study examining how belonging differs across racial/ethnic groups.

In addition to empirical research examining the construct of belonging with adapted measures, some scholars have attempted to develop a valid and reliable measure of university belonging. Lee and Robbins (1995) developed a measure of belonging based on the theory of self-psychology (Kohut & Stepansky, 1984). Rather than developing a single scale assessing university belonging, their results suggested two separate constructs: social assurance and social connectedness. Moreover, there are aspects of belonging (Baumeister & Leary, 1995; Maslow, 1954) that were not addressed in Lee and Robbins’ self-psychology-based conceptualization—namely, the importance of university belonging associated with student’s university affiliation and sense of school-based support (Goodenow, 1993; Pittman & Richmond, 2008; Slaten et al., 2014). In addition to Lee and Robbins (1995), Hoffman, Richmond, Morrow, and Salomone (2002) also realized the need for a measure of belonging at the university level. In their development of the Sense of Belongingness Scale (SOBS), they identified five factor areas from items generated by focus groups: perceived peer support, perceived faculty support, perceived classroom comfort, perceived isolation, and empathetic faculty understanding. The overall measure demonstrated high reliability, but as acknowledged by the authors, no additional steps were taken to assess its factor structure or to examine the validity of the measure. Tovar and Simon (2010) completed a follow-up study on Hoffman et al. (2002), conducting both an exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) on the SOBS. They were unable to replicate the SOBS’s original five-factor structure and instead proposed an entirely new factor structure. In their discussion, the authors acknowledge that research on university belonging remains in its “infancy,” with more work needing to be done to fully understand the construct (p. 212).

The primary limitation with these published works is that they utilized measurements of university belonging that do not exhibit the content validity needed for use with the college student population. The PSSM (Goodenow, 1993), along with similar measures, were specifically designed for youth in K–12 schools at which students adhere to a specific school routine, often being in the same building with the same instructors each day. The complexity of college life clearly demonstrates a deviation from the consistency of K–12 schooling. Due to the autonomy afforded college students, students have a considerable degree of agency in helping to construct the types of academic and social experiences that

facilitate feelings of well-being. Perceptions of support and belonging are likely to vary from situation to situation (e.g., classrooms and professors); therefore, the extent to which students feel they are an essential part of a given context may meaningfully differ from how they feel in other contexts (Burt & Paysnick, 2014; Chen, 2012). This unique element about college life underscores the need to develop a tool that establishes the construct validity of aggregate perceptions of belonging. Thus, in order to measure and understand the construct of university belonging accurately, scholars must acknowledge and seek to understand the meaning of belonging at the university level.

Scholars have long recognized the importance of using mixed methods in scale development (Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005; Mallinckrodt, Miles, & Recabarren, 2016; Worthington & Whittaker, 2006). Before a scale can be statistically analyzed and validated, the construct that a scale aims to measure must be clearly defined (Worthington & Whittaker, 2006). Translating an accurate definition of a construct into a scale enhances its content validity and strengthens its overall utility (Friedenberg, 1995). In an effort to increase the content validity of a proposed measurement, researchers are advised to consult panels of experts (Worthington & Whittaker, 2006), focus groups (Mallinckrodt et al., 2016), or individuals experientially familiar with the construct to inform the creation of potential scale items (Mallinckrodt, 2006). Adhering to the spirit of these recommendations, the current authors conducted semistructured interviews with university students about their experiences belonging to a university and the factors that contribute, or detract, from that experience (Slaten et al., 2016). By asking university students to help define and clarify the construct of university belonging, we were able to connect with the direct lived experience critical to informing the operationalization of a construct (Miles et al., 2016). One of the primary findings of our qualitative investigations was support for the hypothesis that the construct of belonging at the university level appears to be more complex than belonging at the K–12 level. In one study, participants collectively described belonging across four overarching themes: valued group involvement, meaningful personal relationships, environmental factors, and intrapersonal factors (Slaten et al., 2016). Essentially, students identified that if they were able to feel connected and valuable to a group on campus and develop interpersonal relationships that they could ascribe meaning to, then the most important components of university belonging were met. In addition to valued group involvement and meaningful personal relationships, students also identified campus environmental factors (e.g., university pride, living community, classrooms, diversity/inclusion) and aspects of their own personality (e.g., intrinsic motivation, self-awareness) that impacted their sense of belonging on campus. A conceptual model outlining these themes and categories is illustrated in [Figure 1](#).

## The present study

Using the information from previous theoretical and empirical research on belonging, and the recent qualitative work of this research team, the current study was designed. The goal was to design a scale that accurately measures the construct of university belonging informed by this research teams' qualitative research regarding university students defining the construct and utilizing the scientific literature on belonging. As part of this process, we examined the relationship between this new measure, the UBQ, and similar and disparate constructs to establish convergent and divergent validity. This work adds significance to the growing body of literature attempting to examine the importance of belonging at the university level, enhancing the accuracy and value of future research in the area.

In Study 1, we describe the development of the UBQ through the process of generating items based on previous research, recent qualitative work, and discussion among the members of the research team. Next we conducted an EFA based on the items generated in the first step. In Study 2, we conducted a CFA by utilizing the factor structure and items found from the conclusion of the EFA with a new sample of participants. We compare the UBQ to conceptually similar constructs (i.e., general belonging, perceived social support, social connectedness, loneliness) to determine its uniqueness and convergent and divergent validity. Finally, we assessed the incremental validity of the UBQ by examining its ability to explain variance in important student-related outcomes over and above an existing scale of university belonging.

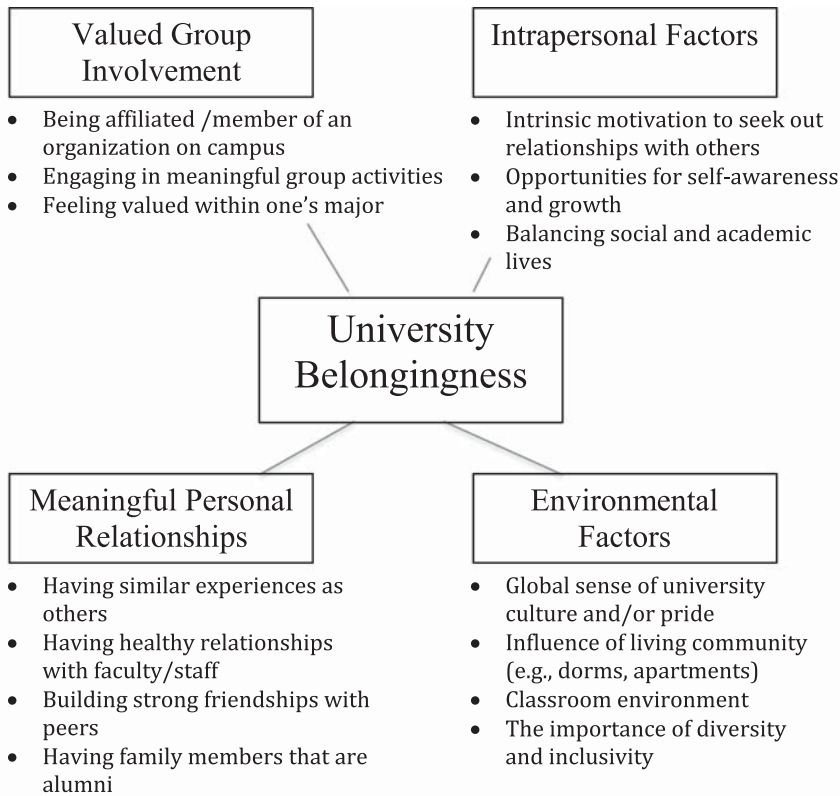


Figure 1. Conceptual illustration of the construct of university belonging based on the results of CITATION BLINDED.

## Study 1: Scale development and exploratory factor analysis

The purpose of Study 1 was to (a) develop items reflecting the sense of university belonging, (b) examine the initial factor structure of the scale, and (c) evaluate the reliability (internal consistency) of the total scale items associated with the identified factors.

## Method

### *Preliminary item construction*

Following the guidelines proposed by Worthington and Whittaker (2006) for maximizing content validity, the initial pool of items for the proposed UBQ was based on the results of a qualitative study examining the construct of university belonging as defined by university students (Slaten et al., 2014). Guided by the results of this study, a team of five graduate students familiar with the literature regarding the construct of academic belonging and one faculty researcher in the field of academic belonging independently generated 20–30 items reflecting the multifaceted domains of university life. All of the items generated were then compiled. Collectively, the group reviewed each item, editing for readability, theoretical accuracy, and removing items inconsistent with the initial theoretical domains and categories. The resulting list had 91 items comprising 10 themes (i.e., meaningful academic work, student group affiliation, peer friendships, relationship with faculty/staff, university culture, personal student identity, classroom environment, living community, university affiliation, and academic major).

The preliminary list of items was then reviewed by a separate panel of two expert faculty researchers in the field of academic belonging. Experts judged the face validity of the items, readability, and theoretical validity (i.e., does the item reflect the intended domain?). Upon receiving the feedback of the

experts, the team removed inconsistent, unclear, and redundant items as recommended, resulting in a final list of 40 items constituting six general domains pertaining to university belonging, which includes the four domains outlined by the teams' previous qualitative work (see [Figure 1](#)): academic major, university culture, personal identity, group affiliation, peer relationships, and faculty and staff relationships.

The UBQ consists of 40 items that correspond to statements about respondents' university experiences and relationship to the university. Respondents are asked to indicate the degree each statement is true to their experience, based on a 4-point–Likert-type scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The psychometric properties of the preliminary UBQ are presented in the Results section below.

### **Participants**

Participants were 421 undergraduate students at a large Midwestern university in the United States. The sample was 54% female ( $n = 226$ ) and 46% male ( $n = 195$ ). The mean age of the sample was 20.04 years ( $SD = 1.51$ ), with a range of 18 to 25 years. In regard to school year, the sample was 20% first year, 26% second year, 20% third year, 23% fourth year, and 11% above fourth year. The mode of participants' involvement in campus organizations (e.g., Greek life, clubs, religious organizations) was two ( $SD = .71$ ). Approximately 6% of the sample reported being an international student, and an additional 11% reported transferring to the current university from another institute of higher education. The racial and ethnic distribution included 80% White/European American, 11% Asian/Asian American, 3% biracial/multiracial, 3% Black/African American, 2% Latina/o, and 1% Native American. In regard to sexual orientation, 93% of participants identified as heterosexual, 4% identified as bisexual, 2% as gay/lesbian, and the remaining 1% other orientations (e.g., questioning). Finally, in regard to subjective socioeconomic status (SES; Adler & Stewart, 2007), the majority of participants (66%) identified as middle class, 19% of participants identified as low SES, and 15% of participants identified as being of high SES.

### **Procedure**

Undergraduate students, ages 18 to 25 years old (i.e., traditional college age), currently enrolled in courses at the research university site were eligible to participate in the study. After obtaining approval from the institutional review board, participants were recruited for this Internet-based survey through a recruitment email sent by the registrar's office to 4,000 random undergraduate students who met study criteria. The recruitment email outlined the purpose of the study and contained a web link to the online survey. A follow-up email to the same potential participant pool was sent a week later to encourage participation. As an incentive, participants were entered into a random drawing for a \$40 Amazon gift card.

A conservative approach to data screening (e.g., elimination of data suggestive of deceit) was taken in an attempt to mitigate concerns about web-based research. A total of 485 individuals consented to participate in the survey, with 42 participants failing to complete at least 85% of the total survey. These individuals dropped out after completing the demographic portion of the survey and did not complete any of the scale items. They were subsequently removed from the sample. Furthermore, 22 participants had missing data for more than 10% of the items and were subsequently removed (Mallinckrodt et al., 2016). Given the adequate sample size for exploratory analyses and controversy over the effects of estimation methods for high levels of missing data in factor analysis (Harrington, 2008), no attempts were made to impute the missing data. For all remaining missing data, available item analysis was used to promote accuracy of the findings for factor and item reduction (Parent, 2012). This method has been shown to be as accurate as other, more complex imputation methods (Parent, 2012, 2013) with low levels of data missing completely at random.

## Results

An exploratory factor analysis (EFA) was conducted to examine the underlying structure of the 40 items of the UBQ using SPSS 20. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .94 and Bartlett's test of sphericity was significant ( $p < .001$ ), suggesting that the data were appropriate for factor analysis (Tabachnick & Fidell, 1996). The EFA sample permitted an excellent sample size with 10.53 cases per item (Worthington & Whittaker, 2006). Factors were extracted using principle axis factoring with an oblique-rotation method (direct oblimin), because it was reasonable that factors constituting university belongingness are intercorrelated.

Factor extraction was based on multiple criteria (Kahn, 2006; Worthington & Whittaker, 2006). Using Cattell's scree test, examination of the scree plot revealed a drastic shift in the slope toward zero between Factor 2 and Factor 3, suggesting an optimal solution of two to three factors. Closer inspection of the pattern coefficients revealed that the three-factor solution had improved interpretability over the two-factor solution with fewer cross-loadings, theoretically coherent factors, and reasonable factor loadings, while cumulatively accounting for 48.17% of the variance.

Following recommendations of Worthington and Whittaker (2006), an item was retained if its loading was greater than .32 on a factor and did not load within an absolute value at or above .15 on any other factor. The scale was refined through an iterative process of deleting items that failed to adequately load onto a factor and conducting a new factor analysis with the remaining items (Kahn, 2006). After numerous iterations, the number of items was reduced from 40 to 24. Removed items included questions related to student's sense of peer social support, group affiliation and engagement, and classroom experience. The 24-item, three-factor model accounted for 57.58% of the total variance in the scores from the rotated solution.

The first factor, university affiliation, comprises 12 items that measure the degree participants associate their personal identity with their university, with higher scores indicative of a strong sense of university affiliation. This factor accounted for 40.76% of the model variance. The University Affiliation factor is associated with two of the four themes of university belonging identified in our previous study (Slaten et al., 2014), including valued group involvement and environmental factors. Categories within these themes align with an overall association with the university, including being a member of campus-affiliated organizations and having a global sense of university culture and/or pride. The synthesis of these themes suggests that valued group involvement and environmental factors are interconnected. These themes are reflected in factor items related to school pride, comfort on campus, and relationships within the campus community and within one's major. Notably, this factor highlights the overlap between an individual's personal identity and student identity in relation to one's sense of university belonging. Thus, a student who takes pride in his or her university and identity as a student there, will also have a strong sense of university belonging.

The second factor, university support and acceptance comprises eight items that measure participants' sense of support and acceptance from their university, particularly the university's ability to provide supportive resources and opportunities for students' personal growth. Higher scores were indicative of a stronger sense of university support and acceptance. This factor accounted for 7.76% of the model variance. The university support and acceptance factor is consistent with our previous qualitative work (Slaten et al., 2014) aligning with the intrapersonal and environmental themes and their associated categories. Specifically, this factor resonates with the categories highlighting the importance of having opportunities at one's university that promote self-awareness and personal growth. This is illustrated in items that stress the importance of university services, opportunities, and support systems that foster student academic and personal growth for university belonging. In addition, this factor also aligns with previous findings that highlight the importance of diversity and inclusion for feeling safe and welcomed. This area is captured in items related to the university's acceptance of cultural customs and the valuing of individual differences. Collectively, these themes denote the importance of students' perception of university resources to their sense of belonging, particularly in regard to the university's ability to facilitate student growth in a supportive and accepting environment.



The last factor, faculty and staff relations, comprises four items and measures participants' sense of connection to university faculty and staff, with higher scores indicative of a stronger sense of connection. This factor accounted for 5.96% of the model variance. Again, this factor relates to the university belonging themes found in previous work (Slaten et al., 2016), specifically, the theme of meaningful personal relationships and the category of having healthy faculty and staff relationships. Faculty and staff are representatives of the university, forming bonds and mentoring relationships with students. As such, faculty and staff have an influence on whether an individual feels welcomed both as a student on campus and within the classroom setting. The experience of feeling cared for, appreciated, and valued by faculty and staff is a facet of university belonging, as the absence of this experience denotes rejection from the university's representatives. Thus, these relationships offer a point of reference for student's sense of belonging and are a unique factor within the construct.

The total 24-item UQB had an internal consistency of  $\alpha = .94$ , and the three subscales had Cronbach's estimates of  $\alpha = .92$  (university affiliation),  $\alpha = .85$  (university support and acceptance), and  $\alpha = .88$  (faculty and staff relations). Supporting the use of an oblique rotation in the EFA, the three factors were strongly correlated: university affiliation with university support and acceptance ( $r = .65$ ), university affiliation with faculty and staff relations ( $r = .47$ ), and university support and acceptance with faculty and staff relations ( $r = .48$ ). Means, standard deviations, and coefficient alphas for each of the factors are reported in Table 1.

**Table 1.** Factor loadings for the University Belonging Questionnaire.

Factor Name and Item	Loadings		
	1	2	3
Factor 1: University affiliation (12 items, $\alpha = .92$ )			
22. I take pride in wearing my university's colors.	.85	.02	-.09
4. I tend to associate myself with my school.	.84	-.01	-.03
8. One of the things I like to tell people is about my college.	.79	.07	.00
18. I feel a sense of pride when I meet someone from my university off campus.	.78	-.04	.04
5. I would be proud to support my university in any way I can in the future.	.71	.07	.01
3. I have university-branded material that others can see (pens, notebooks, bumper sticker, etc.).	.70	-.14	.08
20. I am proud to be a student at my university	.68	.18	-.11
13. I attend university sporting events to support my university.	.67	-.10	-.03
12. I feel "at home" on campus.	.65	.10	.00
24. I feel like I belong to my university when I represent my school off campus.	.61	.13	.05
10. I have found it easy to establish relationships at my university.	.45	.05	.21
15. I feel similar to other people in my major.	.44	.11	.13
Factor 2: University support and acceptance (8 items, $\alpha = .85$ )			
14. My university provides opportunities to engage in meaningful activities.	-.04	.74	-.07
6. I believe there are supportive resources available to me on campus.	-.02	.72	.06
2. My university environment provides me an opportunity to grow.	.04	.69	.02
7. My university provides opportunities to have diverse experiences.	.08	.64	-.07
19. My cultural customs are accepted at my university.	.08	.61	.01
16. I believe I have enough academic support to get me through college.	-.08	.60	.19
9. I am satisfied with the academic opportunities at my university.	.00	.57	.00
11. The university I attend values individual differences.	.09	.50	-.07
Factor 3: Faculty and staff relations (4 items, $\alpha = .88$ )			
21. I believe that a faculty/staff member at my university cares about me.	-.15	.09	.89
17. I feel connected to a faculty/staff member at my university.	.12	-.19	.88
23. I feel that a faculty/staff member has appreciated me.	.06	-.11	.81
1. I feel that a faculty member has valued my contributions in class.	.00	.16	.60
<i>M</i>	37.22	25.62	11.57
<i>SD</i>	6.58	3.21	2.42

*Note.*  $N = 421$ . Structure coefficients extracted with principle axis factoring with direct oblimin rotation method. Internal reliability for the total scale was  $\alpha = .94$ . Participants responded to these items using four response options (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree). The instructions to participants were as follows: "Below is a list of statements that may or may not be true about your experience at college. Please indicate your level of agreement with each statement using the responses provided. Think carefully and respond honestly as there is no "wrong" answer."

## Study 2: Confirmatory factor analysis and validity evaluation

The purpose of Study 2 was to (a) replicate the factor structure of the UBQ through confirmatory factor analysis (CFA) and reliability results obtained in Study 1 in a new sample of university students and (b) examine the convergent, divergent, and incremental validity of the scale.

### Method

#### Participants

Participants constituted a distinct sample of 290 undergraduate students at the same large Midwestern university in the United States used in Study 1. The sample was 54% female ( $n = 157$ ) and 46% male ( $n = 133$ ). The mean age of the sample was 20.39 years old ( $SD = 1.36$ ), with a range of 18–25 years. In regard to school year, the sample was 13% first year students, 36% second year, 26% third year, 18% fourth year, and 8% above fourth year. The mode of participants' involvement in campus organizations was two ( $SD = .63$ ). Approximately 9% of the sample reported being an international student and 6% reported transferring to the current university from another institution of higher education. The racial and ethnic distribution included 76% White/European American, 14% Asian/Asian American, 4% biracial/multiracial, 3% Black/African American, and 3% Latina/o. In regard to sexual orientation, 90% percent of the sample identified as heterosexual, 6% as bisexual, 1% as gay/lesbian, and the remaining 4% as other orientations (e.g., questioning, pansexual). Finally, in regard to perceived SES, 59% of participants identified as middle class, 22% as low SES, and 19% as high SES.

#### Procedure

Similar to Study 1, a new group of participants were recruited via a recruitment email sent by the university registrar's office to 4,000 random undergraduate students. A follow-up email was sent 1 week later to encourage participation. The same study criteria, recruitment email, and incentive to participate that were used in Study 1, as described previously, were used in Study 2, and as in Study 1, a conservative approach was taken in Study 2 for screening the data. A total of 371 individuals consented to participate in the survey, with 78 participants dropping out after the demographics portion and not completing any scale items. An additional seven participants had missing data for more than 10% of the items and were subsequently removed (Mallinckrodt et al., 2016). For all remaining missing data, available item analysis was used to promote accuracy of the findings in the regression analyses (Parent, 2012).

### Measures

In an attempt to examine the convergent, divergent, and incremental validity of the UBQ, measures were selected that are conceptually related and unrelated to university belonging from a proximal standpoint; more distal constructs were not considered for the purposes of this study. We sought to examine whether scores on the UBQ correlated in expected directions with constructs such as general belonging, social support, social connection, and loneliness. In order to examine the convergent and incremental validity of the UBQ above and beyond previously published measures, we also included an existing measure of university belonging.

#### University belonging

University belonging was assessed according to two scales. First, the UBQ consists of 24 items constituting three subscales corresponding to university affiliation, university support and acceptance, and faculty and staff relations. Items are rated on a 4-point scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*), corresponding to respondents' level of agreement to statements regarding their university experience. Scores are summed, with higher scores representing higher levels of university

belonging. Information on the construct, convergent, and incremental validity and reliability is presented below.

Second, university belonging was also assessed using the revised SOBS (Hoffman et al., 2002). Deviating from the original length and five-factor structure of Hoffman et al. (2002), Tovar and Simon (2010) found evidence for a 20-item, three-factor structure, with corresponding subscales of perceived faculty understanding/comfort, perceived peer support, and perceived classroom comfort. Items are rated on a 5-point-Likert-type scale and were reverse coded so that higher scores represented a stronger sense of university belonging. Example items include, “I have discussed personal matters with students who I met in class” and “I feel comfortable talking about a problem with faculty.” Tovar and Simon (2010) reported internal reliability for the subscales as  $\alpha = .89$ ,  $\alpha = .84$ , and  $\alpha = .93$ , respectively. In this study, the internal reliability for each subscale was  $\alpha = .90$ ,  $\alpha = .90$ , and  $\alpha = .93$ , respectively.

### **General belonging**

General belonging was assessed using the General Belongingness Scale (Malone, Pillow, & Osman, 2012), which consists of 12-items constituting the subscales of acceptance/inclusion and lack of rejection/exclusion. Items are rated on a 7-point-Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) with higher scores representing a stronger sense of general belonging. Example items include, “When I am with other people, I feel included” and “I feel like an outsider.” Malone et al. (2012) reported an internal reliability of  $\alpha = .95$  for the total scale. In this study the internal reliability was  $\alpha = .94$  for the total scale.

### **Perceived social support**

Perceived social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988). The MSPSS consists of 12 items with a total scale score and three subscales that measure different sources of support: Family, friends, and significant other. Items are rated on a 7-point-Likert-type scale ranging from 1 (*strongly agree*) to 7 (*strongly disagree*), with higher scores representing higher levels of perceived social support. Example items include, “My friends really try to help me” and “I get the emotional support and help I need from my family.” Zimet, Powell, Farley, Werkman, and Berkoff (1990) reported an internal reliability of .88 for the total scale. In this study the internal reliability was  $\alpha = .92$  for the total scale.

### **Social connectedness**

Social connectedness was assessed using the Social Connectedness Scale (SCS; Lee & Robbins, 1995), which measures the degree of interpersonal closeness between the respondent and others. The SCS comprises eight items rated on a 6-point-Likert-type scale, ranging from 1 (*strongly agree*) to 6 (*strongly disagree*). Scale items are reversed, with higher scores representing a stronger sense of social connectedness. Example items include, “I feel so distant from people” and “I have no sense of togetherness with my peers.” Lee and Robbins (1995) reported an internal reliability of  $\alpha = .91$ . In this study, the internal reliability was  $\alpha = .95$ .

### **Loneliness**

General loneliness was assessed using the Three-Item Loneliness Scale (Hughes, Waite, Hawkey, & Cacioppo, 2004). Respondents indicate the frequency of each statement on a 3-point-Likert-type scale ranging from 1 (*hardly ever*) to 3 (*often*), with higher scores indicative of a greater overall sense of loneliness. Example items include, “How often do you feel isolated from others” and “How often do you feel left out?” Hughes et al. (2004) reported an internal reliability of  $\alpha = .72$ . In this study internal consistency reliability was  $\alpha = .84$ .

## Results

### Confirmatory factor analysis

We performed a CFA on the 24-item scale to test the fit of the 3-factor model identified in Study 1 in relation to two competing alternative models. Specifically, the 3-factor model consisted of the university affiliation defined by 12 indicators, university support and acceptance defined by 8 indicators, and faculty and staff relations defined by 4 indicators. Given the high correlation between the university affiliation and university support and acceptance factors observed in the EFA, we estimated a 2-factor model in which the University Affiliation and University Support and Acceptance items loaded onto a single factor, and the remaining items loaded onto the faculty and staff relations factor. The second alternative model specified all items to load onto a single factor to test the possibility that university belonging is best represented as a one-dimensional construct. The analysis was conducted using maximum likelihood estimation with robust standard errors in Mplus 7.2 (Muthén & Muthén, 1998–2014).

Model fit was evaluated using the (a) model chi-square test, (b) comparative fit index (CFI), (c) root mean square error of approximation (RMSEA), (d) standardized root mean square residual (SRMR), and (e) Tucker-Lewis index. Values of at least .90 for the CFI and TLI indices suggest adequate model fit (Hu & Bentler, 1999). Values of less than .08 indicate acceptable model fit for both RMSEA (Browne & Cudeck, 1993) and SRMR (Hu & Bentler, 1999).

Results indicated that the hypothesized 3-factor model produced a good fit to the data,  $\chi^2(249) = 444.16$ ,  $p < .001$ , CFI = .93, RMSEA = .05 (90% CI: .04, .06), SRMR = .05, TLI = .92. Standardized loadings ranged from .49 to .80 for university affiliation, .52 to .76 for university support and acceptance, and .78 to .82 for faculty and staff relations (see Table 2). The 2-factor model was found to be a weaker alternative to the 3-factor model,  $\chi^2(251) = 594.24$ ,  $p < .001$ , CFI = .87, RMSEA = .07 (90% CI: .06, .08), SRMR = .06, TLI = .86. Finally, the 1-factor model fit the data poorly,  $\chi^2(252) = 913.02$ ,  $p < .001$ , CFI = .76, RMSEA = .09 (90% CI: .08, .10), SRMR = .08, TLI = .73. We then performed a chi-square difference test on the 2- and 3-factor models to determine whether they are empirically

**Table 2.** Standardized factor loadings for the 3-factor CFA model.

Factor/Item	Loading	90% CI
University Affiliation		
UBQ5	.62	(.55, .69)
UBQ24	.80	(.75, .84)
UBQ22	.77	(.71, .82)
UBQ20	.79	(.74, .84)
UBQ10	.53	(.44, .62)
UBQ12	.64	(.56, .72)
UBQ18	.78	(.73, .82)
UBQ13	.49	(.41, .57)
UBQ8	.78	(.74, .83)
UBQ15	.57	(.48, .65)
UBQ3	.57	(.50, .65)
UBQ4	.74	(.50, .65)
University Support and Acceptance		
UBQ6	.62	(.54, .70)
UBQ7	.61	(.54, .69)
UBQ2	.74	(.69, .80)
UBQ14	.69	(.62, .77)
UBQ19	.52	(.43, .60)
UBQ9	.76	(.71, .81)
UBQ11	.71	(.63, .78)
UBQ16	.65	(.58, .72)
Faculty and Staff Relations		
UBQ1	.78	(.72, .83)
UBQ17	.80	(.74, .85)
UBQ21	.81	(.76, .87)
UBQ23	.82	(.77, .88)

Note. UBQ = University Belonging Questionnaire; CI = confidence interval.

distinguishable. The nested 2-factor model was created by estimating the 3-factor model while fixing the covariance between the university affiliation and university support and acceptance factors to 1. Results indicated the 3-factor model offered a significantly better fit to the data,  $\Delta \chi^2 (1) = 53.83, p < .001$ .

### **Invariance based on gender**

Given that prior research points to gender differences in adjustment to college (Enochs & Roland, 2006), we conducted a test of measurement invariance across gender to assess whether UBQ items measure the same constructs for men and women. Invariance testing represents a sequential process of testing the cross-group equivalence of model parameters under increasingly restrictive conditions (Meredith, 1993). A CFA model is estimated for both groups simultaneously with all parameters freely estimated to evaluate configural invariance. Successive models are then estimated in which factor loadings (metric invariance), item intercepts (scalar invariance), and residuals are fixed to equality and are compared. However, the establishment of full measurement invariance through testing the cross-group equality of residuals has been noted as being difficult to achieve due to the highly restrictive nature of the test (Byrne, Shavelson, & Muthén, 1989; Widaman & Reise, 1997). Therefore, we sought to establish partial measurement invariance only and consequently ended the analysis with the test of scalar invariance. The same model indices were used as in the CFA and chi-square difference testing was employed to compare the models. However, because the absolute chi-square difference between two nested models is not distributed as chi-square (Bryant & Satorra, 2012), scaling correction factors were used in the chi-square difference testing. Moreover, the chi-square test is sensitive to sample size (Vandenberg & Lance, 2000), therefore the  $\Delta$ CFI criterion of  $< .01$  (Cheung & Rensvold, 2002) was used as a supplemental index.

The model was first estimated for men and women separately before proceeding to the test of configural invariance. Overall, the model fit the data reasonably well for both males ( $\chi^2 (249) = 413.80, p < .001, CFI = .87, RMSEA = .07$  (90% CI: .06, .08), SRMR = .08, TLI = .86) and females ( $\chi^2 (249) = 451.71, p < .001, CFI = .87, RMSEA = .07$  (90% CI: .08, .10), SRMR = .07, TLI = .85), although CFI and TLI values were below recommended standards. As Table 3 indicates, estimation of the configural model yielded similar fit index values while the metric invariance model was found to be statistically equivalent to the configural model,  $\Delta \chi^2 (21) = 9.01, p = .99$ . Estimation of the more restrictive scalar model yielded a significant decrement in fit from the metric model,  $\Delta \chi^2 (21) = 40.98, p = .006$ , however, a  $\Delta$ CFI value of .006 indicated that the item intercepts could be interpreted as being invariant across gender.

### **Reliability and validity**

#### **Reliability and construct validity**

The internal reliability for the UBQ was consistent with the results found in Study 1, with  $\alpha = .93$  for the total score and  $\alpha = .89$  for university affiliation,  $\alpha = .85$  for university support and acceptance, and  $\alpha = .88$  for faculty and staff relations. Bivariate correlations were computed to further establish the construct validity of the UBQ. This analysis was done in order to ensure that the scores on the UBQ correlate in the expected direction with conceptually related variables and to support the convergent

**Table 3.** Model fit statistics for tests of measurement invariance across gender.

Model	$\chi^2$	<i>df</i>	RMSEA (90% CI)	SRMR	CFI	TLI	$\Delta \chi^2$	$\Delta df$	<i>p</i>	$\Delta$ CFI
Configural Invariance	866.02	498	.07 (.06, .08)	.07	.868	.85	—	—	—	—
Metric Invariance	872.41	519	.07 (.06, .08)	.08	.873	.87	9.01	21	.99	.005
Scalar Invariance	912.51	540	.07 (.06, .08)	.08	.866	.86	40.98	21	.006	.007

Note. Chi-square change values do not represent absolute differences but rather scaled difference values due to the use of scaling correction factors.

**Table 4.** Correlations of the University Belonging Questionnaire with convergent and divergent constructs.

Variable	<i>M</i>	<i>SD</i>	UBQ Total	UBQ University Affiliation	UBQ University Support and Acceptance	UBQ Faculty and Staff Relations
UBQ Total	73.58	11.06	—	—	—	—
UBQ University Affiliation	36.81	6.18	.93**	—	—	—
UBQ University Support and Acceptance	25.38	3.81	.88**	.72**	—	—
UBQ Faculty and Staff Relations	11.39	2.77	.71**	.49**	.53**	—
SOBS Perceived Faculty Understanding/Comfort	17.92	5.67	.44**	.35**	.40**	.57**
SOBS Perceived Peer Support	15.78	5.76	.48**	.44**	.34**	.42**
SOBS Perceived Classroom Comfort	7.98	3.03	.28**	.22**	.21**	.30**
General Belongingness Scale	64.61	13.53	.39**	.41**	.32**	.20**
MSPSS Perceived Social Support	64.51	12.10	.38**	.36**	.36**	.21**
Social Connectedness Scale	39.01	8.64	.40**	.43**	.30*	.22**
Three-item Loneliness Scale	5.07	1.76	-.21**	-.23**	-.12	-.15*

Note. *N* = 290. UBQ = University Belonging Questionnaire; SOBS = Sense of Belonging Scale; MSPSS = Multidimensional Scale of Perceived Social Support.

\**p* < .05; \*\**p* < .001.

and divergent validity of the UBQ. As depicted in Table 4, the UBQ scores correlated with similar conceptual scales as expected. Specifically, the UBQ total scale score moderately correlated with the SOBS perceived faculty understanding/comfort subscale ( $r = .44$ ), the SOBS perceived peer support ( $r = .44$ ), the Social Connectedness Scale ( $r = .40$ ), General Belongingness Scale ( $r = .39$ ), MS Perceived Social Support ( $r = .38$ ), and the SOBS perceived classroom comfort ( $r = .28$ ) and weakly correlated with the Three-Item Loneliness Scale ( $r = -.21$ ). Correlations between the subscales of the UBQ and the above variables ranged from  $r = .57$  to  $-.15$ , with only the university support and acceptance subscale being unassociated with the Three-Item Loneliness Scale.

### Incremental validity

Hierarchical regression analysis was conducted to examine the incremental validity of the UBQ. Incremental validity refers to a scales ability to predict a criterion above what can be predicted by other scales and is commonly tested through the use of hierarchical regression (Hunsley & Meyer, 2003). It was hypothesized that the UBQ subscale scores would uniquely account for the variance within perceived social support, social connectedness, and loneliness scores above and beyond the variance accounted for by an alternative measure of university belonging (i.e., SOBS). These constructs were selected as dependent variables in the analysis, as they all are conceptually related constructs to university belonging and should be able to be explained by the UBQ. Before conducting the multiple regression analyses, data was confirmed to meet assumptions of regression analysis. Specifically, the variables were determined to have no univariate and multivariate outliers, with skewness and kurtosis values no greater than  $\pm 1$  and no issues with multicollinearity or linearity. In all the models, all three subscales of the SOBS (i.e., perceived faculty understanding/comfort, perceived peer support, and perceived classroom comfort) were entered in Step 1 of the regression analysis, with the three subscales of the UBQ (i.e., university affiliation, university support and acceptance, faculty and staff relations) entered in Step 2. As depicted in Table 5, the three UBQ subscales accounted for an additional 8% of variance,  $\Delta F(6, 261) = 11.31$ ,  $\Delta R^2 = .08$ ,  $p < .001$ , in perceived social support over and above the SOBS. Inspection of the beta coefficients revealed that the SOBS perceived peer support ( $\beta = .14$ ,  $p < .05$ ), UBQ university affiliation ( $\beta = .20$ ,  $p < .05$ ), and UBQ university support and acceptance ( $\beta = .20$ ,  $p < .05$ ) subscales all uniquely contributed to perceive social support scores. For social connectedness, the three UBQ subscales accounted for 12% of the variance above and beyond the SOBS,  $\Delta F(6, 262) = 14.36$ ,  $\Delta R^2 = .12$ ,  $p < .001$ . The SOBS perceived peer support ( $\beta = .16$ ,  $p < .05$ ) and UBQ university affiliation ( $\beta = .41$ ,  $p < .001$ ) subscales uniquely explained social connectedness. In the final model, all three UBQ subscales added a significant 3% incremental variance in explaining loneliness above and beyond

**Table 5.** Summary of hierarchical multiple regression for incremental validity.

Variable	Multidimensional Scale of Perceived Social Support			Social Connectedness Scale			Three-item Loneliness Scale		
	B	$\beta$	$\Delta R^2$	B	$\beta$	$\Delta R^2$	B	$\beta$	$\Delta R^2$
Step 1			.13**			.12**			.08**
SOBS Perceived Faculty Understanding/Support	.12	.10		.60	.06		-.15	-.07	
SOBS Perceived Peer Support	.15	.14*		1.46	.16*		-.30	-.17*	
SOBS Classroom Comfort	.07	.07		-.12	-.01		-.10	-.06	
Step 2									
UBQ University Affiliation									
UBQ University Support and Acceptance	.03	.20*	.08**	.60	.41**	.12**	-.08	-.26**	.03*
UBQ Faculty and Staff Relations	.05	.20*		-.03	-.01		.07	.13	
Relations	-.03	-.008		-.14	-.04		.01	.02	
Total $R^2$			.21**			.25**			.11**

Note.  $N = 290$ . UBQ = University Belonging Questionnaire; SOBS = Sense of Belonging Scale.

\* $p < .05$ ; \*\* $p < .001$ .

the SOBS,  $\Delta F(6, 260) = 5.65$ ,  $\Delta R^2 = .03$ ,  $p < .05$ . Again, the SOBS perceived peer support ( $\beta = -.17$ ,  $p < .05$ ) and UBQ university affiliation ( $\beta = -.26$ ,  $p < .001$ ) subscales were uniquely associated with loneliness. These results demonstrate the incremental validity of the UBQ above and beyond a general measure for university belonging.

## Discussion

The goal of the current study was to develop a valid and reliable measure of the university belonging construct. Measurement items were developed from a thorough review of the literature, consultation with belonging researchers, and previous qualitative work. The current research team performed two studies: the first, to conduct an EFA on a large pool of items generated for the scale and, the second, to perform a CFA and validity testing of the UBQ. The final scale yielded 24 items constituting a 3-factor model (i.e., university affiliation, university support and acceptance, faculty and staff relations). Results from both the EFA and CFA provide evidence of the construct, divergent, and incremental validity of the UBQ and its three subscales. These results were consistent with previous work in the field (Baumeister & Leary, 1995; Pittman & Richmond, 2008) and the results of previous qualitative inquiries regarding the definition university belonging (Slaten et al., 2014; Slaten et al., 2016). Specifically, the conceptual framework and measurement of school belonging (Goodenow, 1993) at the K–12 level overlaps with the concept of university belonging based on the results in the current study as it relates to faculty/staff relations and school support. However, the results differ from previous measures (Hoffman et al., 2002; Tovar & Simon, 2010) in that the concept of university affiliation was a significant factor of overall university belonging, suggesting that belonging is more than just relational. In alignment with our previous work, the final UBQ scale was similar to the vast majority of our previous findings with the exception of relationships with peers (Slaten et al., 2014). This qualitative work suggested that meaningful personal relationships and valued group involvement with peers and faculty were important. However, through the scale development process we found that the peer items did not load in the final scale that was developed. One possible explanation for this is that although peer relationships are important to university students, perhaps they are seen as separate from the sense of university belonging. Each of the three UBQ subscales, along with the total scale score, demonstrated strong internal consistency and markers of several different forms of validity testing. It is important to note, however, that while the 3-factor model fit the data quite well in the CFA involving the overall sample, some decrements in model fit were observed when the model was fitted for each gender group separately in the measurement invariance test. Although the factor loadings and item intercepts were found to be invariant across gender, this decrement in model fit may be indicative of qualitative differences in the way

that men and women perceive their university environments. We encourage researchers to replicate our gender invariance analysis in future research involving more diverse samples of college students. Overall, initial support from this study for the UBQ provides an opportunity for educational researchers to utilize this scale to ascertain students' perceived level of belonging at their university. Below, we discuss each subscale separately to elucidate the impact that each section of the scale has on the overall construct of university belonging.

### University affiliation

The university affiliation subscale yielded 12 items that were consistent and demonstrated strong reliability, it was also the largest subscale. University affiliation, based on the items loading on the factor, is defined as a perceived sense of membership to the university that includes pride about demonstrating that one is a part of a large group. This could include such things as participating in university sporting events as a fan, wearing university apparel, verbally discussing with others outside of the university community about one's university affiliation. The importance of an affiliation or pride was consistent with the previous qualitative work understanding the construct of university belonging from the student perspective (Slaten et al., 2014; Slaten et al., 2016). However, as mentioned above, this factor was not part of the structure of other belonging measures and requires scholars to consider affiliation as a factor in what makes up belonging at the university level. Because this theme is consistently identified in both quantitative and qualitative studies, it is clearly something that is salient for students. The idea of being proud of the university that you attend and of its reputation seems to be related to a positive experience for students, and it would be useful for future researchers to examine whether or not this is related to well-being, motivation, and college retention.

### University support and acceptance

The current study revealed a second factor that demonstrated a strong reliability among subscale items and collectively could be considered student perception of acceptance and support from the university. This subscale included items that involved an individual's perception of feeling supported and accepted unconditionally by the university. Items included acceptance based on individual differences, access to resources on campus, and acknowledgments of individual successes across campus. The concept of perceived level of support from the university is consistent with Hoffman et al.'s (2002) study, which also found two factors that involved perceived support from university personnel as a part of the sense of belonging construct. Future research should examine the possibility of perceived support and acceptance and the implications these perceptions might have on student academic and retention outcomes. Further, it would be important for university personnel to be able to identify which supports specifically lead to students' positive perceptions of university support and acceptance.

### Faculty and staff relations

The third factor that yielded a reliable construct was faculty and staff relations. Each item on this subscale demonstrated the importance of developing relationships between faculty or staff members at the university. The items loading on this factor suggest that it is valuable for students to feel a sense of acceptance and affirmed value from university employees specifically. The seminal work of Goodenow (1993) included similar items in her development of the PSSM, leading to significant contributions to the field of K–12 school belonging. Further, Hoffman et al. (2002) found that having empathetic faculty understanding allowed students to feel a greater sense of belonging at the university. The results of the current study would suggest a similar idea—that relationships between faculty and staff with students is crucial, particularly as the idea pertains to feeling accepted or empathically heard. Noticeably absent from the final scale were items related to relationships with peers at the university, a contrast from the previous attempts at university belonging measures (Hoffman et al., 2002; Tovar & Simon, 2010). Although there were items in the initial pool, they did not load onto a meaningful factor. We suspect



that although peer relationships are clearly important to university students, perhaps these relationships not be related to how students conceptualize university belonging.

## Limitations

The results and conclusions regarding the UBQ should be interpreted in light of a number of limitations in its development. First, although the sample sizes for each study were adequate, data collection for both studies took place at a single institution. Thus, the mean scores and standard deviations depicted for the UBQ might not be accurate for other samples at different institutions. Second, the majority of the participants in both samples identified as White, limiting the ability to conduct more-nuanced comparisons between subsamples of racial/ethnic groups. Future research with a more diverse student sample might explore potential differences between students' level of university belonging and race/ethnicity, particularly in relation to the institutions' demographic makeup. Third, data were collected exclusively through an online survey and a number of participants failed to complete a substantial portion of the survey (i.e.,  $n = 42$  in Study 1,  $n = 85$  in Study 2); the incomplete surveys were subsequently discarded. While it is common in scale development to exclude cases that fail to complete more than 10% of the items (Worthington & Whittaker, 2006), it is unknown how such exclusions might influence the integrity of the data. Given that the excluded participants appeared to drop out early in the survey, with the majority dropping out after the completion of the demographics portion of the survey, it is reasonable to assume that the incompleteness rates are not attributable to scale items. In addition, the samples suffered from a low response rate and thus the results may be subject to non-response bias. Response rates for college students do tend to be lower than community samples, with some estimates averaging 22% for college students (Shih & Fan, 2008). Regardless of these limitations, the samples appeared to adequately represent the sample population, as the samples were demographically similar to the student population at the researched institution and the variables were normally distributed.

## Implications

The development of the UBQ, a valid and reliable measure of university belonging, is timely as universities across the country are continually under pressure to increase retention numbers and funding for higher education continues to be a concern. The concept of belonging at university is not new but has been underresearched and inconsistently measured (Hoffman et al., 2002; Tovar & Simon, 2010). Previous measures were adapted from K-12 belonging scales (e.g., Goodenow, 1993) or lacked reliability and validity from preliminary studies. The UBQ was developed based on college students' conceptualizations of the belonging construct and the 3-factor structure includes elements that other scales have not utilized. This enhances our understanding of the uniqueness of university belonging and differentiating it from K-12 school belonging, allowing for future researchers and higher education professionals to continue to find the nuance differences between K-12 schooling experience and higher education. The UBQ allows for future research surrounding constructs that could predict higher levels of belonging and shed light on how belonging influences retention, academic-related outcomes, and psychosocial factors. The current study examines proximal factors that align with university belonging; future work could examine these more distal factors (e.g. academic performance, retention, class attendance). Further, researchers can now examine the impact of college major on belonging, whether belonging is perceived in the same way across types of colleges and majors. Overall, the current study presents unique evidence suggesting that a sense of university affiliation plays a predominant role in how students conceptualize belonging at their university and that further research within the field of higher education is needed.

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