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Sense of Belonging as Behaviorist Construct: “Doing Belonging” and its Application for College Students with Disabilities

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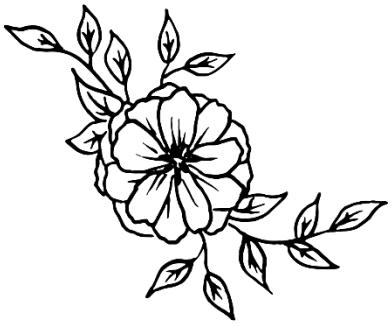

Sense of Belonging as Behaviorist Construct:

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Dissertation

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Abstract

Sense of Belonging has been widely linked to academic performance, retention and persistence for college students. Students with disabilities are less likely to enroll than peers, and are more likely to drop out. Similar to other historically-marginalized groups, these students report lower sense of belonging than peers. Research with this population suggests that they may be seeking ways of building community and belonging at their universities which are self-driven. This notion of "doing belonging", as it is described in the sociological literature, appears at first glance to be compatible with behaviorist approaches to student support. Although not without controversy, behavior analytic methods have demonstrated efficacy in supporting students with disabilities in developing a wide range of skills. However, sense of belonging is rarely discussed by behaviorist scholars. This three-paper dissertation investigates sense of belonging as a behaviorist construct.

First, a behaviorist framework for belonging is outlined through concept analysis, drawing on Skinner's *Verbal Behavior*.

Second, a narrative review of educational literature on sense of belonging identifies behaviors among students, faculty, and at the institutional level that support belonging.

Third, an empirical mixed-methods study evaluates the efficacy of Acceptance and Commitment Training in developing richer psychological flexibility and sense of belonging.

Keywords: behaviorism, sense of belonging, disability, acceptance and commitment training, higher education, mixed methods research

Sense of Belonging as Behaviorist Construct:

"Doing Belonging" and its Application for College Students with Disabilities

One can visit the website of most any major college or university in America and find, generally on an *About Us* page, a brief statement of that university's mission. Many of these statements will include information about educational excellence or a commitment to research innovation. Many will express a desire to serve the unique community where their school is located. Increasingly, universities are expressing a commitment directly to their students through these pages: that *our campus is a place you can belong*.

Part of the drive behind this increased desire to express the connectedness of a college community is increased attention to the idea of *Sense of Belonging*. Indeed, many university initiatives for Diversity, Equity, and Inclusion (DEI) now directly encompass Belonging (as DEBI, often). This pivot towards emotional appeal rather than exclusive claims of academic

excellence is not simply driven by a desire to appear warmer, or appeal to the imagined needs of a new generation of students. Indeed, there are decades of research informing universities' understanding of sense of belonging, underlining the reality that the degree to which a student feels they are connected to their academic community influences their motivation (Freeman et al., 2007), retention (Pedler et al., 2021), and academic performance (Edwards et al., 2022).

With so much on the line, it certainly behooves universities to promote belongingness among their students. However, students from historically marginalized groups may encounter barriers in developing sense of belonging (Strayhorn, 2012). This can stem in part from policies or systems which disadvantage them (Gray, 2020), but can be mitigated through the development of social connections within the university community (Hoffman, 2002). While belonging among students with disabilities can be similarly shaped by access to social and academic opportunity, it is also shaped heavily by students' ability to self-advocate and their sense of mastery of their academic role (Vaccaro et al., 2015).

For universities seeking to foster sense of belonging among students with disabilities, simply providing access to student groups, learning communities, and social opportunities may not fully address the needs of this population. Given the impact of belonging, this poses a serious concern. Students with disabilities tend to take longer to graduate than their peers (Knight et al., 2016), and are more likely to drop out (Carballo et al., 2021). By helping these students acquire the tools they need to belong, universities may be able to mitigate these effects, and promote greater academic success among students with disabilities. While social support can be a crucial part of this equation, some form of direct, skills-based approach to improved self-advocacy and mastery of student role may also be required.

Behaviorist approaches have been widely effective in supporting skill development across a number of diverse populations, skill targets, and contexts (Heward et al., 2022). Behaviorism today is most commonly associated with Applied Behavior Analysis (ABA: Baer et al., 1968; 1987) as applied to the support of skill development among autistic children (Axelrod, 2012). However, behaviorism also underpins several clinical therapeutic approaches, including Cognitive Behavior Therapy (CBT: Beck, 2020) and Acceptance and Commitment Therapy (ACT: Hayes et al., 1999). Behaviorism has a rich history of applications supporting students with disabilities, including autism – however, as of yet it has not been brought to bear in helping to understand sense of belonging within this population.

Behaviorist approaches may be uniquely suited to the support of belonging among college students with disabilities. Given the importance of self-advocacy within this population, interventions which can support the development of more confident advocacy behaviors could be impactful. Given the importance of sense of mastery, traditional behaviorist approaches could help remediate gaps in academic skills which build confidence. Clinical applications such as ACT might even be effective in directly shaping students' psychological flexibility, fostering greater confidence or sense of belonging directly.

In order for behaviorist approaches to be considered in the study of sense of belonging, a few critical needs must be met. First, there must be an agreed upon operational definition of belonging and sense of belonging which behavioral scientists could apply to its study. Second, it must be clear that there are observable behaviors directly tied to the development of sense of belonging among students. Third, there must be some indication that behavioral methods are effective and acceptable as applied within this population. These three elements represent the

foundation for a behaviorist approach to the pursuit of sense of belonging – and they are the focus of the studies collected here.

The Idea of Belonging

The term sense of belonging could be argued to imply the existence of both a somewhat objective *belonging* and, separately, an individual's "sense" of that reality. Belonging has been argued by psychologists to be a fundamental human need, notable for its inclusion in the middle of Maslow's hierarchy of needs (Maslow, 1968). Baumeister & Leary (1995) argue that belonging is a "fundamental human motivation" (p. 520), which is shaped largely by social interaction with members of one's community. Dewall and Bushman (2011) echo both the importance of belonging and its grounding in social relationships, arguing that a desire to belong has driven much of the development of our civilization, and that a sense that one does not belong (alienation) can at times lead to maladaptive behavior. Belonging then, can be understood to be shaped and built by one's relationships to others. However, it would be difficult to quantify belonging as simply an arbitrary number or quality of social relationships.

Walton and Brady (2017) define belonging as "the perceived fit between the self and a context" (p. 500). This definition would seem to challenge the idea of belonging as separable from one's perception of it. By this line of thinking, belonging and sense of belonging would at first appear to be somewhat synonymous. However, there is a valuable distinction. At its most rudimentary, sense of belonging is one's perception that one belongs.

***Belonging** is the degree to which one fits within a given environment.*

This distinction is valuable because, in practice, the study of sense of belonging implies a dialogue. On one hand are the actions of institutions, seeking to broadcast to students that they

belong. On the other are students, whose response to that messaging shapes and is shaped by their perception of the degree to which they fit within that institution. At a university, this sense a student may have that they "fit" can directly impact their success – it is for this reason that sense of belonging has been the focus of so much study.

A Sense of Belonging

Within the context of higher education, sense of belonging is commonly defined in terms of a student's perception of their connection to their community. Strayhorn (2018) defined sense of belonging as a student's "perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers" (Strayhorn, 2018 p. 4). There are echoes of Baumeister & Leary's focus on social connections to others in this definition, as well as Walton and Brady's observation that the concept of sense of belonging lies in the relationship between self and context. If one were to seek to simplify this definition, it might look like this:

> ***Sense of Belonging*** *in higher education is the degree to which a student feels they fit or have meaningful connections within the context of their university.*

This sense of connection can have significant practical consequences for students. Sense of belonging has been variously linked to concrete success measures including retention (Hoffman et al., 2002; Pedler et al., 2021) or dropout risk (Suhlmann et al., 2018), as well as academic performance (Chun et al., 2016; Edwards et al., 2022). Broadly speaking, students who experience a stronger sense of belonging are more likely to graduate, and likely to perform better within individual courses. These practical outcomes of sense of belonging can be contextualized

through its impact on the self for students. Sense of belonging has been found to connect to cognitive constructs related to academic performance, including motivation (Freeman et al., 2007; Cox et al., 2021; Pedler et al., 2021), self-regulated learning and self-efficacy (Pedler et al., 2021; Won et al., 2021). Students who experience a stronger sense of belonging are more likely to feel motivated to perform, to feel confident in their approach to their coursework, to be independent in their completion of their course material.

The contextual nature of sense of belonging has, historically, led to a desire to understand the factors which shape it for individual students. This has historically led to qualitative assessment of student experience, in addition to survey measures such as the Sense of School Membership scale (PSSM: Goodenow, 1993) or Sense of Belonging Instrument (SOBI: Hagerty & Patusky, 1995) which assess the strength of students' sense of belonging.

Within the postsecondary literature, a number of factors have been identified connected to students' sense of belonging. Relationships with faculty commonly emerge as a crucial factor (Strayhorn, 2008, 2012; Sedgwick & Rugeau, 2010), as do peer interactions (Strayhorn, 2008). These results are consistent with the more substantial literature on sense of belonging among middle and high school students. In a thorough meta-analysis, Allen et al. (2018) identified a number of factors influencing belonging, including peer and teacher support, extracurricular and environmental factors, and individual-level characteristics of students.

Given the stakes associated with belonging among college students, understanding the factors that shape it is critical for universities. These factors present opportunities for individual-level intervention. Faculty interactions, as an example, can be supported either through training or policy designed to encourage more supportive faculty or through intervention designed to bolster the communication ability of students. Peer interactions can, and often are, fostered in

universities by the creation of opportunities for peer-to-peer engagement within clubs and social events. In order to understand how best to prioritize and shape these actions, a thorough model of the factors shaping belonging is needed.

A Model of Belonging

Ahn and Davis (2020a) sought to understand the interaction and nature of the factors shaping belonging among university students. They administered a qualitative instrument to a large group (n = 426) of students, coding the results for factors connected to belonging. The authors reviewed individual answers citing factors such as "clubs and societies", "friendly lecturers", "accessibility", etc. and sought to mold these results into a cogent model of the different factors shaping belonging. Their assessment led to four domains of belonging:

1. **Academics:** Factors including rigor, curriculum, and faculty relationships
2. **Social:** Factors including peer support and opportunities for social engagement
3. **Surroundings:** The physical and cultural affordances of the local environment
4. **"Personal Space":** A sense of one's satisfaction with self and student identity

A number of individual factors can be traced to these broader categories. Within the Academic domain, factors such as a student's perception of course difficulty and engagement with resources such as tutoring, academic advising, and faculty can shape belonging – this is consistent with existing literature which has emphasized the importance of such factors in shaping belonging for college students (Freeman et al., 2007, Miller et al., 2018). Within the Social domain, relationships with peers are centered, though this can be expressed through friendships or structured opportunities for connection such as clubs or events. These factors, too,

are consistent with other belonging literature, which emphasizes the significance of social connection to peers (Holloway-Friesen, 2018; Anistranski & Brown., 2021).

Within Ahn and Davis' (2020a) study, Academics and Social factors were the most commonly identified, with social being by far the most frequently identified (1,289 mentions) and academics the second (541). However, the domain of Surroundings (320) or environment is also consistent with the literature. Physical affordances of a space can influence belonging, particularly access to "green space" (Mulrooney & Kelly, 2020). Students with less physical access to campus tend to experience lower sense of belonging, e.g: commuters (Holloway-Friesen, 2018) and online students (Peacock et al., 2020).

The domain of Personal Space, though following closely behind Academics in frequency (464), is somewhat less explored. Some research has indicated a connection between sense of belonging and mental health (Stebleton et al., 2014; Gopalan & Brady, 2019). However, other factors identified as part of what Ahn and Davis call "Personal Space", such as life attitudes and satisfaction, are less understood. Given the impact of sense of belonging on cognitive constructs, there may be value in exploring this domain further.

Disparities in Belonging

When considering belonging as the "fit between self and context" (Walton & Brady, 2017), there is a need to understand not only the contextual factors within an institution that shape it, but the ways in which these factors can interact with the unique characteristics of individual students. In the broader context of sense of belonging, Allen et al.'s (2018) meta-analysis identified a number of individual-level characteristics which can influence belonging, including demographic characteristics such as race/ethnicity, gender, and socioeconomic status.

The ways in which these groups experience belonging has been a major focus of the study of belonging in post-secondary education (Strayhorn, 2018). Historically marginalized groups are known to experience lower levels of belonging (Duran et al., 2020) than peers, which has cascading impacts on motivation and performance.

A number of different groups have been found to experience disproportionately lower belonging. First-generation college students generally report lower sense of belonging than continuing-generation peers (Stebleton et al., 2014; Museus & Chang, 2021). Research with this group emphasizes lower engagement with academic resources such as advising, tutoring, and faculty, which may connect this group's belonging experience primarily to the Academic domain. Students from lower socio-economic status backgrounds also experience lower belonging (Ahn & Davis, 2020b) than economically advantaged peers. This research references both Academic and Social domains, and both factors may be influenced by individual characteristics for this group.

Much of the research into increasing sense of belonging for these students focuses on systemic factors at the institutional level. Campus climate is often cited as linked to belonging for historically marginalized students (Maramba & Museus, 2013; Kim et al., 2018; Budge et al., 2020), as is the presence of historically-marginalized members of faculty and staff (Francique, 2018), and interactions with a diverse group of peers (Hussain & Jones, 2021). Some studies have emphasized the value of behavioral factors in shaping belonging for these students, such as inclusive teaching practices (Goering et al., 2022).

Belonging and Disability

Students with disabilities have enrolled in higher levels at colleges around the country over time, and represented about 11% of the overall college population in 2015 (National Council on Disability, 2015). While somewhat less is known about the belonging experience within this population (Vaccaro et al., 2015, Teng et al., 2020), qualitative explorations of their belonging experience tend to demonstrate barriers to belonging for this population. As with other students, social connectedness and factors linked to belonging are known to influence academic success and persistence for these students (Fleming et al., 2017). Like other historically marginalized students, some of the barriers to belonging for these students are systemic or environmental. Access to and effectiveness of ADA accommodations can influence sense of belonging for these students (O'Shea & Kaplan, 2018), as can the physical accessibility of spaces (Strange, 2000). However, some of the exploratory research into the belonging experience of this population suggests an increased importance of behavioral factors.

Vaccaro et al.'s (2015) grounded theory study of the belonging experience of students with disabilities identified three chief influences on belonging for this population: self-advocacy, social relationships, and "mastery of the student role" (p. 679). Each of these domains is subject to behavioral influences. Self-advocacy is ultimately a set of skills enabling students to speak to their needs and access services – Vaccaro et al. offer a quote from a student that indicates the value of self-care behaviors (e.g: exercise), and mentioned explicit instruction in these strategies as part of an outpatient program (p. 677). Social relationships can be supported through individual behavior or institutional behavior as well; one of Vaccaro et al.'s participants explicitly called out the availability of social support groups (p. 680) where they could interact with students with the same diagnoses. Mastery of the student role is explained by Vaccaro et al.

as performance of key academic skills (p. 679). These are individual level behaviors, which can be supported or improved through access to resources such as tutors or academic coaches.

Other research has cited the value of disability identity in shaping belonging for this population (Raver et al., 2018). This is consistent with Ahn & Davis's (2020a) conception of the critical role of "personal space" in shaping belonging. While this identity may be best shaped through systemic shifts in viewing disability through a Social Model (Goering, 2015) at the institutional level, there may be means to directly support this identity construction through the behavior of individual staff members in disability resource offices. Given the value of explicit skill-building for this population, they may uniquely benefit from an understanding of belonging at the level of individual or institutional behavior.

"Doing" Belonging

This notion of belonging as subject to the influence of behavior at the individual level is not new. Sociology researchers have used the phrase "doing belonging" (Polat, 2022) to describe the way that belonging is co-created through behavioral exchange between an individual and the community to which they seek to belong (p. 40). Much of this research has stemmed from the desire to understand the belonging experience of historically marginalized groups within society at large, rather than a specific educational context. There is a political component to this view of belonging (Yuval-Davis, 2007; May, 2011), which emphasizes the power dynamics and expectations between the community which sets standards for what one must *do to belong*, and what an individual does in support of their own belonging. In the context of research into migration, researchers have studied the impact of assimilation behaviors on successfully "doing" belonging (Skrbis et al., 2007). Spickard (2013) underlined the internal conflict that can stem

from efforts taken to assimilate in order to belong, which is somewhat consistent with claims made about doing belonging among Autistic college students (Pesonen et al., 2020).

This framework of "doing belonging" has been introduced in a small number of educational studies, largely in international contexts. Drawing on the Sociological research on doing belonging among refugees within society, Puskás (2016) studied preschool-aged children of refugees, and found that coaching them to learn the steps and lyrics to a common Swedish children's song supported their sense of belonging within their school setting.

For the purposes of this dissertation, "doing belonging" should be understood as follows:

> **Doing Belonging** *in higher education is the co-construction of a student or staff member's sense of belonging through the influence of an individual community member's behavior or patterns of behavior.*

This definition is consistent with educational research which has shown belonging to be a process, subject to change over time (Gopalan & Brady, 2020) at the individual level. If we are willing to view sense of belonging as a behavioral exchange between a student and their environment, then an understanding of Behaviorist approaches to the study and influence of behavior may be worthy of being integrated into the study of belonging.

Behaviorism

Behaviorism has its roots in the writings of John Watson, who viewed early Psychology as overly focused on invisible, imprecise phenomena located within the mind and difficult or impossible to measure directly (Watson, 1924). Watson felt that the observable behavior of individuals was the only appropriate lens for intervention in mental health, as any other construct was overly subjective. Contemporary behaviorism is largely associated with B.F. Skinner, who

expanded on Behaviorism (Skinner, 1974) and crafted basic definitions and theories for the field which remain influential today. Skinner's chief influences, aside from Watson, were Pavlov, whose study of canine salivation famously underpins much of our understanding of operant conditioning (Pavlov, 1927), and Edward Thorndike. Thorndike's "Law of Effect" (Thorndike, 1898) held that behavior can be influenced positively or negatively by its consequences, depending on whether these were aversive (unpleasant) or appetitive (pleasant). These influences coalesced in a core underpinning of contemporary behaviorism: Skinner's three-term contingency (Skinner, 1974). This is the assertion that any instance of behavior should be understood through an exchange of the behavior and its influences:

1. **Antecedent:** The events or environmental circumstances immediately preceding an instance of behavior
2. **Behavior:** An interaction between an organism and their environment
3. **Consequence:** The immediate outcome of a behavior, typically seen through a shift in the environment around the organism

Others have argued for an understanding of a four-term contingency, which incorporates the presence of a *discriminative stimulus* – a stimulus within the environment which signals the availability of reinforcement (Walker, 1942).

Like Watson, many contemporary Behaviorists argue that the study of behavior should focus solely on the observable. Skinner, however, argued for the value of *Radical Behaviorism*, a Behaviorist philosophy which holds that so-called *private events* (internal processes such as thoughts and emotions), although resistant to observation, can be understood through the same contingent processes (Chiesa, 1994). There is disagreement within the field on the value of private events, leading some to argue the existence of multiple parallel behaviorisms (Staddon,

2021). Some radical behaviorists acknowledge private events as subject to the Law of Effect, but argue they are irrelevant to the study of behavior (Baum, 2011). Others have argued for the importance of an understanding private events in the study of behavior (Friman et al., 1998).

Remembering the definition of belonging as a perceived relationship between self and context (Walton & Brady, 2017), any Behaviorist pursuit of belonging must be Radical. The following sections will outline the current state of Behaviorist practice and theory, including alternative Behaviorisms which may be better suited to an understanding of belonging.

Applied Behavior Analysis

Behaviorism in practice is most commonly associated with Applied Behavior Analysis (ABA: Baer et al., 1968;1987). ABA is, essentially, the application of the principles of behavior as outlined by Skinner and other experimental researchers into the *prediction and control* of *socially significant behavior* (Baer et al., 1968). For the purposes of this dissertation, ABA should be understood through the following definition:

> **Applied Behavior Analysis** *is the assessment and implementation of structured environmental manipulations designed to impact socially-significant human behavior*

While many consider ABA synonymous with a regimented approach to skill development for young Autistic children (Axelrod et al., 2012), it has a wide range of applications. In Heward et al.'s (2022) review of the applications of ABA, the authors list over 350 distinct "socially significant domains" in which ABA has been applied, ranging from addiction studies, to general education, to industrial safety. In its broadest applications, ABA has been argued to be evidence-based (Slocum et al., 2014).

ABA has been applied in a number of contexts to support individuals with disabilities. It is most commonly associated with Autism, particularly with the assessment and development of language skills (e.g: VB-MAPP: Sundberg, 2008) and functional analysis of aggressive and self-injurious behavior (Iwata et al., 1994; Hanley, 2012). However, ABA has also been argued effective for the support of individuals with Down Syndrome (Neil et al., 2021), hearing impairments (Richling et al., 2011), and multiple sclerosis (Motl et al., 2018). In educational settings, behavior analytic practices have shown efficacy in supporting academic skills (Watkins et al., 2022). Given these indications, it is possible that traditionally behavior analytic practices could be effective in supporting college students with disabilities in either developing concrete self-advocacy skills or honing their mastery of the student role.

As a practice, ABA is directly in line with the expectations of Watson and Skinner – it is adherent to the assessment of observable behavior, and focused on its prediction and control. Parallel behaviorisms less rigid in their view of behavior have developed alongside ABA, which may represent not only a truer evocation of Skinner's Radical Behaviorism, but a more utile approach to the understanding of sense of belonging through a Behaviorist lens.

"Contextual" Behaviorism

One of the largest alternative behaviorisms is the field of Contextual Behavior Science (CBS: Zettle et al., 2016). CBS differs from other behaviorisms in several key respects. First, contextual behaviorists are more willing to consider the role of the private event (p. 48); they embrace the radical behaviorist conceit that private events are responsive to operant conditioning, but define their goal not as the *control* of such behavior but its *influence* (p. 40). A contextual behaviorist, in other words, may view an individual's depression as a worthy target of intervention, but intervention into that depression would be undertaken through the influence of

directly observable behavior. This is best described through CBS' theoretical framework, *functional contextualism* (Biglan & Hayes, 1996), which assesses the validity of knowledge through its utility and seeks to understand behavior through its contextual influences. CBS is best known through the research on its practical applications – Relational Frame Theory (RFT: Hayes et al., 2001) and Acceptance and Commitment Therapy (ACT: Hayes et al., 1999).

Relational Frame Theory

RFT is a theory of language and cognitive development which describes a set of logical frames which govern that development (Villardaga et al., 2007). While some aspects of RFT may provide intriguing lenses for the understanding of belonging (e.g: deictic framing, which underpins RFT's understanding of empathy [Villardaga et al., 2012]), these considerations fall outside the scope of this current study – RFT is best understood as a theoretical framework designed to explain ACT, the applied practice for which CBS is best known.

Acceptance and Commitment Therapy

ACT is a therapeutic approach which in some ways resembles (and has common origins with: Hayes, 2008) Cognitive Behavioral Therapy (CBT: Beck, 2020). ACT practitioners view the goal of their practice as identifying their clients' points of psychological inflexibility, and seeking to influence them toward greater flexibility. ACT defines six dimensions of psychological flexibility – acceptance, defusion, self-as-context, present moment awareness, values, and committed action:

- **Acceptance:** Ability to remain present with unpleasant stimuli, including emotional content, rather than avoiding such stimuli at personal cost

- **Defusion:** Ability to view rules governing the world around the self flexibly, rather than overly adhering to them, resulting in rigid rule-governed behavior (Hayes, 1989)
- **Self-as-context:** Awareness of the self as a listening entity, processing and responding to thoughts as behaviors
- **Present moment awareness:** Mindful attention to the present moment, rather than past or future contingencies or stimuli

The overall goal of ACT is that clients be able to engage in consistent committed action in line with their values (Hayes et al., 2013). ACT has a considerable evidence base, including over 900 randomized control trials totaling over 50,000 participants (http://bit.ly/ACTRCTs) as of the writing of this dissertation. It has been applied previously in the support of college students (Chase et al., 2013; Scent & Boes, 2014; Mullen et al., 2021), with positive outcomes.

While it may be unlikely for a wide range of individuals within a university to apply ACT clinically, in recent years a framework for non-clinical applications, called Acceptance and Commitment Training (ACTraining: Dixon et al., 2020; Tarbox et al., 2020) has emerged. When applied as ACTraining, practitioners would refer their clients elsewhere for treatment of clinically-significant mental health symptoms, but could approach the training of behaviors to increase flexibility and support positive outcomes related to their values. Szabo et al. (2020), for example, worked with young Autistic athletes with the goal of improving rock-climbing performance. Traditionally behavior-analytic methods were applied, as well as an ACT intervention targeting psychological flexibility.

ACTraining may provide a valuable framework for student affairs professionals to approach sense of belonging for students with disabilities. Elements of ACT could be layered within tutoring or coaching services, which might improve their support of student role mastery.

Self-advocacy could, perhaps, be better supported by working with individual students to approach the task more flexibly, or through the lens of their closely held values. ACT is well-documented in support of social anxiety (Krafft et al., 2020; Lee et al., 2021), and may support students in building more effective peer relationships.

Theoretical Framework

One might expect a behavioral researcher to skew positivist – as highlighted in the above review, behaviorism classically focuses on the prediction and control of observable behavior, which imply certain positivist values – namely, that there is a "correct" way to behave, which individuals should be steered toward, and that the behavioral observations of experts can be deemed reliable and absolute. By contrast, I am approaching my research in this dissertation through the lens of interpretivism (Gadamer, 1975). I believe that behavior is orderly: that reinforcement increases the rate of behavior and punishment decreases it. Where I differ, and what guides my approach to belonging is my belief that these principles do not apply along a spectrum of absolute Truth. What is reinforcing to one is not reinforcing to another. An intervention which is effective in one environment is not effective absolutely. There are contextual factors which shape the orderly processes of behavior, which cannot be directly measured. In order to understand them, we must be willing to interpret them, or ideally to allow those we study the opportunity to offer their own interpretation.

This stance is, in my opinion, consistent with the theoretical stance of functional contextualism, which guides my approach to belonging. Functional contextualists seek to understand the *unique event in context* (Biglan & Hayes, 1996). Belonging is well suited to the application of this lens. Belonging, when understood as doing belonging, is a network of both

observable and private events that shape and are shaped by their context. These lenses have driven my approach to this three-paper dissertation, which seeks to establish:

1. A framework through which sense of belonging can be interpreted consistently in behavioral research
2. The observable events which influence the private event of sense of belonging
3. Whether Acceptance and Commitment Training is effective in influencing committed actions which promote belonging

The selection and determination of these ontological and epistemological lenses have been heavily shaped by my career and life experiences, and a brief acknowledgment of positionality is appropriate here.

A Note on Positionality

It is uncommon for researchers in behavior science to provide any statement regarding their positionality. Whether this is explained by the deterministic assumptions of the field, or simply the formal traditions in the major journals which publish this work is difficult to say. Whatever the explanation, one would be hard pressed to find any single-case study in which positionality is discussed beyond a quick note on the qualifications of the researchers to perform the interventions under study. Positionality is more commonly discussed among qualitative researchers, however, and given the interpretivist nature of any assessment of sense of belonging, it feels appropriate to include a brief acknowledgment of a few relevant aspects of my positionality here, to provide context for my approach to this research.

First, to address the question of qualification as a behavioral researcher would. I have trained with recognized experts in the application of ACT, and have experience in its application

to the support of college students with disabilities in other context through my role supporting them in a university Disability Resource Office. I am a licensed BCBA, with experience in single case research methodology as well as behavior analytic practice. These acknowledgments have value in establishing an expectation of treatment fidelity. However, additional information is warranted to understand my approach to interpretation of belonging.

It is critical to understand that, first and foremost, I approach this research problem as a person with a disability. I have lived with chronic pain caused by frequent kidney stones throughout my adult life, and this began during my undergraduate tenure at James Madison University. The impact of that experience, and my inexperience at that time with navigating self-advocacy in my relationships to professors, resulted in my probation and near suspension from that university. The memory from this time which perhaps best colors my approach to this research is, for me, a poignant one.

In January of my freshman year, having failed more classes than I passed due to frequent pain having kept me from the classroom, and my professors being unable or unwilling to reschedule missed tests or content, I stood in the office of the Dean of the Honors College. Her job in that meeting was to inform me that I could no longer continue in that program. I tried to provide an explanation for what had happened – that I had been in incredible pain which had resulted in multiple hospital visits. That my mental health had been impacted, not only by this change in my health but by a close friend's repeated suicide attempts. She held firm to her stance that I could not continue. Her suggestion, which I believe was well-intentioned, was that it may be best for me to leave the university for a time to focus on my health and wellness.

What I heard, however, was not the kindness she may have intended. What I heard was *you do not belong here*.

My life has, in many ways, been shaped by the isolation I felt during my freshman year, and the subsequent choices I made. In the context of this research, it has led me to a set of assumptions:

- Students with disabilities should have an expectation of being able to belong on a college campus, regardless of the state of their health or mental health
- Students with disabilities should be empowered to advocate on their own behalf, and identify ways of connecting to their campus should their health or mental health stymy their academic progress

I believe the literature supports some of these assumptions, but it is worth acknowledging my own relationship to them as many researchers would focus on systemic factors of accessibility rather than the students themselves. I share this in part to acknowledge a bias, but in part for clarification: by focusing my research on the behavior of students, it is not my intention to absolve universities of responsibility. It is an acknowledgment that, even when well intentioned, universities may fail students. Those students must be empowered to build belonging for themselves.

Belonging and Sense of Belonging

Throughout my three papers, I am relying on my understanding of sense of belonging. Although I center my understanding of belonging in higher education in Strayhorn's (2018) book on the topic, my view of the factors shaping belonging and its domains has been most heavily influenced by Ahn & Davis' (2020a) model, described at length above. I have also been heavily influenced by Gopalan & Brady's (2020) review of the topic, which not only highlighted the disparities in belonging for historically marginalized groups, but identified belonging as a

process subject to change over time. My understanding of belonging can be visualized as a common conceptual framework across the three papers.

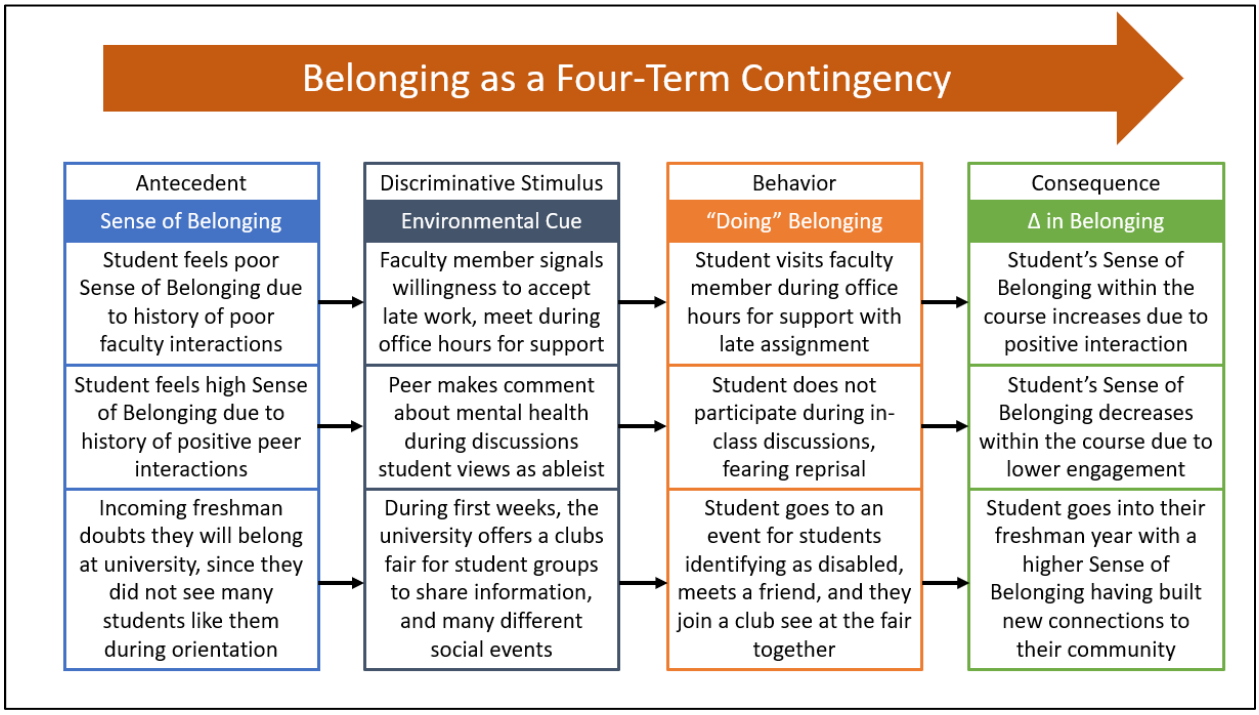


Figure 1: Examples of four-term contingencies shaping Sense of Belonging

Figure 1 above shows several examples of a four-term contingency around Sense of Belonging at a university. Belonging has the potential to constitute a complete four-term contingency, with the antecedent typically being a student's pre-existing sense of belonging, the discriminative stimulus the actions of another party in the environment, the behavior some form of "doing belonging", and the consequence a change (delta) in the students' sense of belonging. This provides a model for a "process" of belonging, as the changed sense of belonging would become an antecedent for another instance of behavior, ad infinitum. Institutional behavior, as well as the behavior of faculty and staff, can serve as a discriminative stimulus for behaviors identified to support belonging. Where these are identified, these can be encouraged or explicitly taught to students, with the hopeful result being a process-belonging that results in an increase.

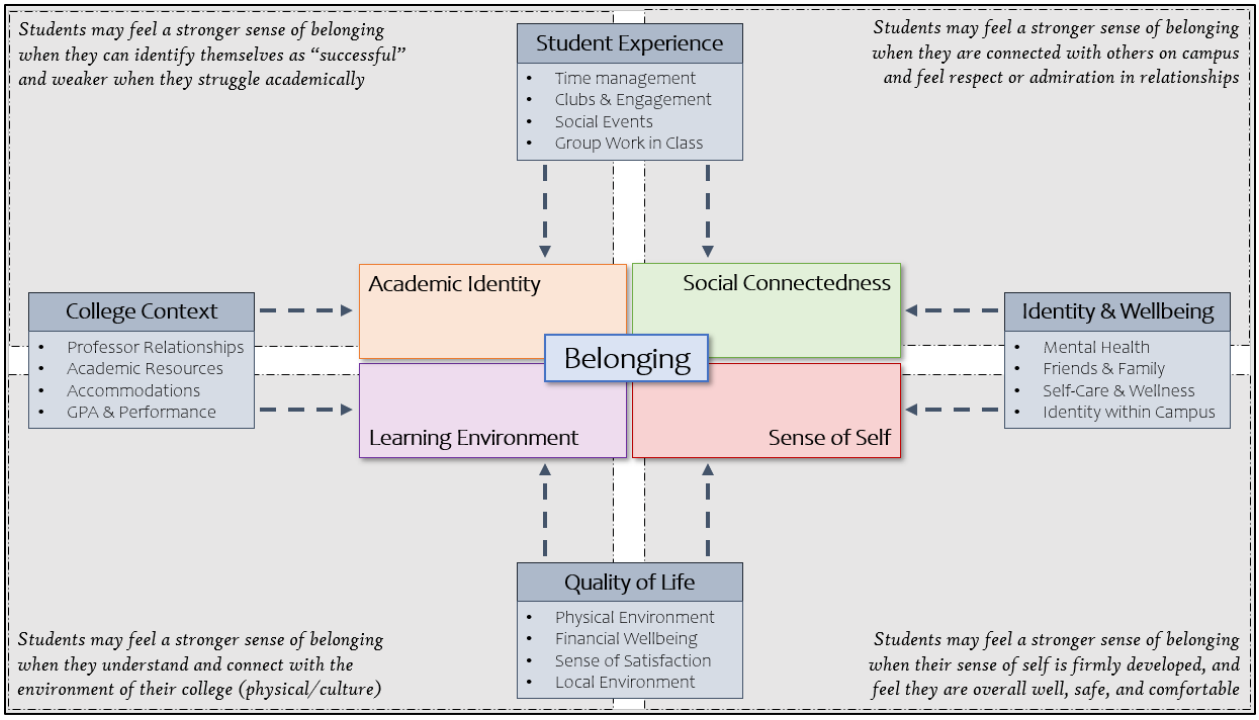


Figure 2: Sense of belonging model visualized

Figure 2 expands on and visualizes Ahn & Davis's (2020) model, providing examples of items which may fall under each domain of belonging. These two models help to visualize my understanding of belonging, which guides all three papers under this dissertation.

Belonging at the Level of Individual Behavior

In this initial chapter, I have sought to provide an overview of the challenge this research seeks to address. In even a shallow review of the sense of belonging literature, it should be easily identified as a subject of social significance for behavior analytic research. Sense of belonging has been connected to a wide range of academic constructs, to overall college success, graduation, and retention. Students with disabilities are known to encounter disparities both in their academic outcomes and their reported sense of belonging. Initial attempts to provide overviews and models of the unique lived experience of belonging for these students indicates a desire for direct empowerment, and supporting practicable, shapeable skills such as self-

advocacy. Behavior analytic methods have been shown to be effective in supporting skill development of this nature, but as of yet belonging has not been an object of study in the field. In part, this is due to philosophical barriers in navigating discussion around belonging.

I have attempted to answer three main questions in this dissertation, roughly corresponding to the three papers included:

1. How would a behaviorist describe and understand sense of belonging?
    a. What value does this construct hold to behavioral research?
2. How is belonging constructed and shaped at the level of individual behavior?
    a. Are there behaviors currently known within belonging research to be supportive?
3. Can direct behavioral intervention among college students with disabilities lead to an increase in their sense of belonging?
    a. Does Acceptance and Commitment Training support the increase of psychological flexibility and belonging for students with disabilities?

Given the distinct, separated nature of these questions, the three-paper format is ideal. Each paper turns its attention to a distinct question with a distinct set of methods.

Paper 1: Towards a Behavioral Framework of Belonging

In the first of three papers comprising this dissertation, I provide a detailed outline of belonging as understood through a behaviorist lens. I approached this theoretical work as a concept analysis, making a direct comparison of Skinner's *Verbal Behavior* (Skinner, 1957) and commonly-used definitions of sense of belonging within educational research. I employed Walker and Avant's (2005) method of concept analysis. This method follows eight steps:

1. Selecting a concept

2. Determining the aim of the analysis
3. Identifying all possible uses of the concept
4. Determining the defining attributes
5. Identifying a model case
6. Identifying additional cases
7. Identifying antecedents and consequences
8. Defining empirical referents

This approach is heavily language-driven, and potentially appealing to behavioral researchers given its fundamental aim is the development of an operational definition. In completing this paper, my hope is that it has produced a workable definition that upholds behaviorist values but is of value to either behaviorist or non-behavioral educational researchers.

Paper 2: A Review of Behaviors That Support Sense of Belonging

In the second paper, I have conducted a narrative review of the literature related to sense of belonging in the context of higher education. The goal of this review is to assess which behaviors have been identified, whether by researchers or by the self-report of students under study, as supportive of sense of belonging.

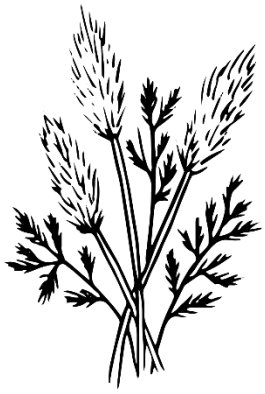
I used Academic Search Complete to conduct a series of structured searches using the following terms: “Sense of Belonging” + “Postsecondary Education”, “Sense of Belonging” + College, “Sense of Belonging” + University. All included articles were peer-reviewed, English language, and localized to the United States. I have also limited my search to articles published since 2010.

After pulling the articles from these searches, I identified articles which specifically addressed student or faculty behaviors linked to sense of belonging. In order to be considered a behavior, it must be observable and measurable. The review describes trends and patterns in the literature on behaviors identified as supportive of belonging, and offers recommendations to students, faculty, and staff seeking to support sense of belonging.

Paper 3: Acceptance and Commitment Training to Support Flexibility & Belonging

In the third and final paper, I conducted an empirical evaluation of an ACTraining intervention designed to support college students with psychological flexibility. This mixed-methods study blends multiple-case study, quantitative, and qualitative methods to assess the efficacy of ACT for four students at a large university. Each student completed a pre-and-post intervention survey assessing sense of belonging and psychological flexibility.

During the period of intervention, qualitative and quantitative data were gathered on student's belonging and flexibility. These distinct data sources were assessed individually, and as a cohesive whole, contextualized primarily through the voice of the student, as represented in their qualitative data.



“Somewhere You Feel Free”:

Towards a Behavioral Framework of Belonging

Abstract

Sense of belonging has become a major focus of research in a number of fields where behavioral researchers and practitioners apply their knowledge – but despite this, little research exists in behaviorist literature on the topic. There may be many factors at play in this absence of scholarly attention, but one possibility is that the current definitions and frameworks for belonging that drive research in these areas do not strike some behavioral researchers as compatible with their own principles and theoretical frameworks.

In this article, the author employs a structured concept analysis to outline a definition of sense of belonging which may be more accessible to behaviorist thought. Through this outline, the definition includes case studies, empirical referents, and an argued means for assessing, measuring, and intervening in sense of belonging through behavioral methods. The goal of this paper is to begin to establish a shared language for discussing this critical topic, in the hopes of bringing the strength of behavioral practice to bear on this pressing need.

Keywords: behaviorism, sense of belonging, disability, concept analysis

"Somewhere You Feel Free": Towards a Behavioral Framework of Belonging

When Tom Petty walked into the studio to record the song that became *Wildflowers,* it was as yet unwritten. The song was an idea barely formed, his voice channeling an unexpressed need his therapist would claim was a desire to communicate with his innermost self (Zoladz, 2020). As the words tumbled out into the song that headlined the album, widely considered to be his best, Petty tapped into a universal notion. *You belong somewhere you feel free* (Petty, 1993).

The idea of belonging as an essential human need is not unique to Petty's lyrics. Belonging is situated in the middle of Maslow's pyramid (Maslow, 1968), above safety and below esteem. Research on belonging has argued its status as a *fundamental human motivation* (Baumeister & Leary, 1993) – something which can have a transformative effect on human behavior, driving social interactions at a micro or macroscopic scale. Its impact has been studied in a wide range of contexts, including migration (Skrbis et al., 2007), cult membership (Coates, 2013), and, recently, social media addiction (Gao et al., 2017). In educational research, the concept of *Sense of Belonging* has become prominent in the literature, and has been variously linked to retention (Suhlmann et al., 2018; Pedler et al., 2021), academic performance (Chun et al., 2016; Edwards et al., 2022), and motivation (Cox et al., 2021). Broadly speaking, students who feel a greater sense of connectedness and belongingness within their learning environment are understood to be more likely to succeed.

It would appear that belonging and the pursuit of belonging can have dramatic consequences. Nevertheless, there is little mention of belonging or the desire to belong within behaviorist literature – despite the fact that behavioral researchers often apply their science to the same domains where belonging is so commonly discussed (Heward et al., 2022). In part, this

may be due to the absence of a behaviorally-oriented definition of belonging - as summarized in Allen et al.'s (2021) conceptual review of the topic, the existing literature on belonging variously emphasizes its status as a "trait… a core biological need", or as a "state… influenced by various daily life events and stressors" (p. 89). In other words, either the bi-product of internal emotional activity, or a fleetingly-conscious response to systemic and cultural factors. The purpose of this article is to outline a framework of belonging that is compatible with behaviorist principles, including a means of understanding the mechanisms by which belonging impacts behavior.

Expectations of Behaviorism

In defining standards for the field of Applied Behavior Analysis (ABA), Baer, Wolf and Risley (1968; 1987) established a focus on *socially significant behavior.* Given the link between belonging and educational attainment, there is a clear pathway to viewing the support of sense of belonging as socially significant. Contemporary understanding of this value emphasizes the goal of behavioral services as seeking "the betterment of the lives of all the children and families we serve" (Alai-Rosales et al. 2022), which is certainly facilitated by improving access to educational attainment. Among autistic adults, who commonly have a history of receiving behavioral services (Axelrod et al., 2012), educational attainment and employment are generally linked to improved quality of life (Mason et al., 2018). Given that sense of belonging reduces dropout rates and increases likelihood of graduation and performance (Suhlmann et al., 2018; Cox et al., 2021), it is a worthy target for behavioral intervention.

What is less clear is whether sense of belonging represents a target which could be taken under behavioral study. Baer et al. (1968) emphasize the importance of observability, arguing that "a subject's verbal description of his own non-verbal behavior usually would not be accepted as a measure" (1968 p. 93), unless it were able to be confirmed through other means.

Traditional measurement of sense of belonging typically relies on verbal self-reports (Goodenow, 1993; Hagerty & Patusky, 1995). It is, at its heart, a perception held by an individual. Any behavioral framework of belonging should seek to understand it through the lens of verbal behavior, as it is otherwise difficult or impossible to observe.

Sense of Belonging

In seeking to define belonging for educational psychologists, Walton and Brady (2017) labeled it "the perceived fit between the self and a context" (p. 500). This definition emphasizes the perceptual nature of belonging, which is consistent even when the construct is distinguished further. Strayhorn's (2018) definition of sense of belonging in educational research marks it as a student's "perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers" (p. 4). Although this definition is more explicit, it does not provide an immediate rubric by which the construct can be observed within the context of its environment.

Research on belonging has identified factors which contribute to it, and which may assist somewhat with this challenge. Belonging is commonly associated with social engagement with peers or teachers (Allen et al., 2018; Strayhorn et al., 2018), as an example - these social interactions could be measured based on parameters predictive of belonging, should those parameters be understood. There is some limited evidence that, for some populations, specific skills or behaviors can directly influence Sense of Belonging – for students with disabilities self-advocacy skills have been linked to increased reported belonging (Vaccaro et al., 2015; Teng et al., 2018), which can be taught, and assessed through direct observation. These contextual factors

may provide a means for behavioral researchers to understand and, potentially, influence sense of belonging.

Functional Contextualism

In recent years, a parallel behaviorism known as Contextual Behavior Science (CBS: Zettle et al., 2016) has gained increasing prominence, even within traditional behavior-analytic spaces (Dixon et al., 2020; Tarbox et al., 2020). While CBS is generally best recognized through its applied research, particularly Acceptance and Commitment Therapy (ACT: Hayes et al., 1999) and Relational Frame Theory (RFT: Hayes et al., 2001), it is also inclusive of a theoretical framework uniquely suited to the understanding of belonging: *Functional Contextualism* (Biglan & Hayes, 1996).

Functional contextualists, unlike some other behaviorists, are willing to apply their science to the understanding of private events (Zettle et al., 2016, p. 48). While traditional behaviorism focuses exclusively on the observable, CBS often seeks to understand private events such as anxiety (e.g: Swain et al., 2013) through the lens of its observable context. This, in part, leads to a changed goal for functional contextualists, who seek not the prediction and *control* of behavior, but its *influence* (Zettle et al., 2016, p. 40). They view their unit of measurement as the "unique event in context" (p. 39), a measure which incorporates both an instance of behavior and the contextual factors which influence it. Sense of Belonging is well suited to this framework – it is a private event difficult to observe directly, but is known to be shaped by many contextual factors.

Given this compatibility, it is likely that applied CBS research, particularly ACT, could have utility in the understanding of sense of belonging. However, due to the prevalence of Sense

of Belonging in education and other spaces where behavioral research is applied, there is value in a behavioral framework of belonging with utility to both CBS and traditionally behaviorist study.

Parameters for Defining Belonging

We have designed our behavioral definition of belonging as an application of CBS and functional contextualist principles, seeking to uphold the following values to promote broad utility in a variety of behaviorist contexts:

1. Belonging should be understood through the lens of verbal behavior.
2. There should be a means of observing and assessing sense of belonging.
3. There should be clear examples and non-examples of sense of belonging in practice.

In this article, sense of belonging will be explored through a structured Concept Analysis, which should provide a methodological framework for the creation of a definition meeting these criteria.

Methodology

Concept Analysis is performed routinely within nursing research and other social science disciplines as a means of generating operational definitions for nebulous concepts to practitioners. Generally, these are brief articles – often referencing resources like encyclopedias or dictionaries – serving to establish an agreed upon definition, rather than reporting the results of an empirical method of theory development. In Anaker & Elf's (2014) concept analysis for "sustainability", for example, the authors employ a literature review as their primary means of data collection, consulting existing literature within their field, and referencing literature in other fields as well as dictionary definitions to further contextualize the term. Bonis's (2008) analysis

of knowing proceeds similarly, with a brief summary of what was currently known in the field at that time included, afforded by higher prevalence of the topic in the literature at that time.

The method is considered valuable to theory development (Risjord, 2009; Nuopponen, 2010), but has thus far seen little use in the context of research in the behavioral sciences. For the purposes of defining sense of belonging here, I will be employing Walker and Avant's (2005) method. This method involves eight distinct steps (Walker & Avant, 2005; Anaker & Elf, 2014):

1. Selecting a concept. "Choosing a concept for the analysis is preferably performed according to by the author's own interest and expertise or is selected on the basis that it iscrucial for our research" (p. 382)
2. Determining the aim of the analysis. "When determining the aim of the analysis, it must be clear and concise and be possible to follow up in the next steps." (p. 382)
3. Identifying uses of the concept
4. Determining the defining attributes. "This step comprises the heart of concept analysis. The goals are to choose a cluster of explanations for the term found in the data collection and to keep these explanations as brief as possible." (p. 382)
5. Identifying a model case
6. Identifying additional cases
7. Identifying antecedents and consequences
8. Defining empirical referents. "The empirical references describe how the concept is utilised in research and in practice." (p. 382)

For the purposes of this review, steps 1-3 can be considered to fall under the prefacing literature review, which outlined the purposes of the analysis, the selection of the concept of

belonging, and the application of sense of belonging within educational research. A simplified version of this content analysis is available in theAppendix to this review.

The remainder of this review will follow steps 5-8 of this analysis, drawing jointly on the research on belonging within educational literature and the ways in which social behavior is understood in behavior analysis through the lens of Skinner's *Verbal Behavior* (Skinner, 1957).

Defining Attributes

Educational researchers generally assess sense of belonging through self-report or through assessment of qualitative data from students. Generally, students are considered to have lower sense of belonging if they report, as an example, an absence of friendly connections with peers at their school (Goodenow, 1993). In models such as Ahn & Davis's 2020 model, sense of belonging is understood to be influenced by a student's sense of confidence or mastery in academic performance, their social connections in the educational context, their physical comfort within the setting, and their overall wellness and wellbeing (Ahn and Davis, 2020).

This broad range of influences and contextual factors might best be summarized as a student's history of reinforcement or learning history within their educational context. A student whose historical interactions with a teacher of a certain subject tend toward the aversive (e.g: being scolded for not knowing material) may, as a result, express a lower sense of belonging. A student with limited social opportunity in the classroom or school environment would be likely to express lower sense of belonging.

On a practical level, this is understood in educational research to lead to lower performance and engagement (Pedler et al., 2021). A behaviorist might tie this phenomenon, in part, to the Law of Effect (Thorndike, 1927) – a student is less likely to perform behaviors

associated with academic engagement if they have a history of not receiving reinforcement for those behaviors. Given this understanding, one might understand belongingness as a kind of motivating operation, moderating the impact and apparentness of reinforcement available to a student within their educational setting. Sense of belonging, in behavioral terms, might best be understood as a tact of this motivating operation, providing observers with the information needed to adjust the learning environment, either increasing available reinforcement or providing clearer signals to the availability of reinforcement.

Model Cases, Antecedents & Consequences

If we accept this view of sense of belonging as a student's signal of their understanding of the motivating operations at play in their educational context, this conveys an abstract possibility that belonging may serve as a contextual factor influencing the success of interventions in educational settings, potentially functioning as a confounding variable affecting social validity and treatment fidelity for these procedures. A teacher may, in other words, implement an antecedent intervention otherwise considered to be evidence-based practice and find it ineffective with a student whose low sense of belonging has diminished the efficacy or apparentness of the reinforcement the teacher is intending to provide.

The following sections imagine a few cases demonstrating this principle – in each case, the hypothetical intervention will be discussed in the context of a student with low or high sense of belonging at baseline:

Case 1: Social Skills Group

Henrietta is a researcher at a large university, seeking to develop social skills programming for autistic students attending the school. She is confident she has developed programming that is

similar to other, evidence-based programs described in the literature, and that she and her team have the training and resources to implement it effectively. Among the recruited students are:

Roger: Roger is nineteen, and attended a large public high school where he was frequently ridiculed by peers. He was assigned a roommate in his Freshman year who posted cruel comments about him on social media. When Roger brought this to the attention of his RA, they did not take any action, saying it was "just a joke" and that Roger should let it go.

Wilson: Wilson is eighteen. He was homeschooled, and his family describes him as a bit shy. He is transgender, and lives in specialized community housing at the university. He does not go to a lot of social events, but has a positive relationship with the people in his residence hall.

Roger would be expected to express a lower sense of belonging to the university than Wilson, given his history of poor treatment by peers. Although both students may need social support, Roger's history of aversive interactions with university staff might color his interaction with Henrietta and her intervention team.

Given this history as an antecedent, Roger becomes frustrated easily during intervention sessions. He makes some progress, but slowly, and the team finds it has not generalized when following up. Wilson, by contrast, participates eagerly in the intervention, learns new skills, and begins making meaningful connections within his specialized housing.

Case 2: Good Behavior Game

Marcus is a teacher in a third grade integrated classroom, who has decided to implement the Good Behavior Game (Barrish et al., 1969) to reduce incidence of off-task behavior during their math activities. He is confident this intervention is evidence-based, and is confident he will be able to implement it successfully as he has done so previously. Among his students are:

Trisha: Trisha has dyscalculia, and finds math extremely frustrating. In her class last year, her fellow students made fun of her for getting answers wrong, and her teacher did not address this.

Nikki: Nikki has never been particularly good at math, but began working with a tutor recently who has been very helpful. Nikki knows Marcus, who is a family friend.

One would expect Trisha to report a lower sense of belonging in the context of a math course than Nikki, based on her learning history. Although both students might be prone to off-task behavior during math, one might expect Trisha to be less likely to engage when prompted.

Given this history as an antecedent, Trisha seems unmoved by the rewards at the end of the Good Behavior Game. She persistently engages in off-task behavior, and when her peers ask her to stop, she does not listen – many of these peers are the same ones who have made fun of her previously. Nikki, by contrast, is motivated to persist with math activity. Her team receives their reward, and her grades in math slowly improve.

Case 3: First Year Student Success Course

Ty works for a university's Multicultural Center, and as part of that role teaches a student success course for first year students. Some aspects of the class are focused on topics such as race, gender, and sexual expression, and some students seem unsure how to discuss these. Ty is eager to improve participation in class discussions among their students, and was recommended a set of conversational prompts that they understand to be effective for that purpose by an experienced colleague. Among their students are:

Omi:

Omi was a high-school cheerleader, and was very involved in social justice work as a student government representative in high school. She is already connected with the student

organization, and attends numerous meetings and events there.

Joshua:

Joshua is a first generation student, and comes from a smaller rural environment that is very different than the city where the university is located. He has had a hard time adjusting, and has been upfront with Ty that he feels he has few friends on campus.

One might expect Omi, who is social, outgoing, and already connected, to feel a strong sense of community and belonging on campus. Joshua, who is isolated, and in a very different environment from what he has known before, may not.

Ty's conversation tool seems to help Omi, and many other students, as the concrete questions and answers allow them to jumpstart an otherwise difficult conversation. Omi is excited about returning to a topic she is passionate about, and becomes something of a classroom leader. Joshua, meanwhile, withdraws further during class discussions, sitting alone and refusing to join groups. When Ty approaches him to ask why, he shares that he does not feel comfortable with this topic, and would rather stay out of it. Ty has read his papers, and knows he has many opinions on the topic. It may be the case that his isolation, and lack of belonging, influence his level of comfort with the discussion - and therefore, the efficacy of Ty's efforts.

Although these cases are hypothetical, there is a logical pattern here that is worth exploring. Most practitioners will have had the experience of a supposed evidence-based practice being less effective with a given student, or an expected reinforcer being less valuable to one student than the rest of their class. While a number of factors can explain these phenomena, sense of belonging has utility in the context of educational intervention as a potential rubric for understanding how a student may perceive or engage with a given intervention.

Empirical Referents

If interventionists intend to anticipate the potential impact their students' sense of belonging may have as a contextual antecedent, they must have a means of meaningfully understanding and assessing it. In current educational research, this is primarily achieved through self-report surveys or interviews. It would certainly be a simple matter for behavioral researchers to integrate opportunities for self-report in the collection of baseline data, and at the conclusion of interventions. This information may also provide helpful context toward the social validity of their interventions. However, some researchers may feel they have an obligation to seek more observable referents.

To find observability in belonging, it is helpful to return to the elements of Ahn & Davis's model (Ahn & Davis, 2020). They identified four domains which consistently influenced sense of belonging among students, namely Academics, Social Connectedness, the Local Environment, and what they called "Personal Space". Two of these provide a keen opportunity for observation:

- Academics: A student's performance history, their engagement with resources e.g: tutors, office hours, their behavioral record, their history with specific professors can all be indicators of their learning history related to this domain of belonging.
- Social Connectedness: At its most complex, researchers can gauge this through social network analysis (Scott, 1991). On a more rudimentary level, practitioners can observe the social interactions of students and assess how the number of friendships, or history of interactions with peers, may impact a student's sense of belonging.

Of the remaining domains, “personal space” is largely an internal phenomenon best observed through indirect measures such as self-report. The local environment can be understood in practical terms – its physical accessibility may be a factor for some students, and generally speaking the availability of green spaces within a school setting is understood to promote sense of belonging (Thompson et al., 2023). However, these are factors which may be difficult to meaningfully address through antecedent intervention.

Conclusions & Implications

By its nature, a review like this one cannot hope to empirically validate the existence of sense of belonging as a concrete behavioral phenomenon. The goal of this Concept Analysis was to move towards a shared understanding of sense of belonging that might allow behavioral researchers to contribute to the development of this critical concept in educational research.

For the purposes of an initial definition, we propose the following:

- ***Belongingness describes a student’s history of reinforcement within their educational settings***
- ***Belongingness can function as a motivating operation – moderating the value and apparentness of reinforcement within the educational setting***
- ***Sense of belonging in education may be understood as a student’s tacting of their understanding of the social contingencies within their educational context.***

It is our hope that his definition will be refined in future research, and that behavioral researchers may begin to see the value in considering sense of belonging as a potential component of understanding the success and social validity of educational interventions.

What does "Doing Belonging" Look Like, Anyway?

A Review of Behaviors That Support Sense of Belonging

Abstract

Sense of belonging is well understood in educational literature to impact student retention, academic performance, and overall success. In higher education, a number of factors have been identified in connection to student sense of belonging, including peer connection, and supportive interactions with faculty.

This literature review serves to analyze a large swathe of the literature on belonging with the goal of identifying trends in individual behaviors accomplished at the student level, faculty level, and institutional level which have been found to support the growth of sense of belonging for students. Where these behaviors intersect with one another, this was noted in the analysis. Recommendations and implications for university staff and administrators are included.

Keywords: sense of belonging, institutional support, student affairs, higher education

What does "Doing Belonging" Look Like, Anyway?

A Review of Behaviors Supporting Sense of Belonging

Introduction

Sense of belonging in higher education has been variously linked to retention (Freeman et al., 2012; Pedler et al., 2021), motivation (Suhlmann et al., 2018), and academic performance (Cox et al., 2021). Belonging itself has been asserted to be a fundamental human motivation (Baumeister & Leary, 1993), and students who report a stronger sense of belonging generally also report higher levels of overall well-being and mental health (Strayhorn et al., 2015). Research in belonging among both graduate (O'Meara et al., 2017) and undergraduate (Strayhorn, 2008) students has identified factors such as social relationships with peers and faculty which can be supportive of, or hindering to, belonging.

Other studies have cited the impact of internal characteristics such as cultural, racial, or mental health factors (Gummadam et al., 2015; Rainey et al., 2018) on sense of belonging. Some research has shown changes in Sense of Belonging occurring over time (Gopalan & Brady, 2020) within the same students While some of this change may be driven by factors internal to the student, other changes could be the result of manipulable external context. In theory, a university could focus on specific practices, policies, and procedures among faculty and staff, or encourage key student behaviors to encourage sense of belonging among their student body. The purpose of this study is to provide a review of the existing literature on sense of belonging in higher education, in order to identify observable, measurable behaviors which universities can encourage to promote belonging.

Sense of Belonging

Sense of Belonging is commonly defined in terms of a student's perception of their inclusion within a college community. Strayhorn (2018), defined it as a student's "perceived social support on campus, a feeling or sensation of connectedness, and the experience of mattering or feeling cared about, accepted, respected, valued by, and important to the campus community or others on campus such as faculty, staff, and peers" (p. 4). At its simplest, it can be understood as the "perceived fit between the self and a context" (Walton & Brady, 2017). These definitions emphasize the perceptual nature of the construct. At its core, sense of belonging is the reaction of a student to their environment. It is commonly assessed through self-reports, e.g: the Sense of School Membership scale (PSSM: Goodenow, 1993) or Sense of Belonging Instrument (SOBI: Hagerty & Patusky, 1995), which asks students to describe these perceptions by providing a numerical rating to the accuracy of statements such as "Other students in my school take my opinions seriously" (PSSM: Q4) or "I feel like a piece of a jig-saw puzzle that doesn't fit into the puzzle" (SOBI-P: Q5).

While the construct itself is somewhat resistant to direct observation, its context is rich with factors which have the potential be shaped by the actions of individuals. A number of factors have been found to shape sense of belonging: most commonly, peer and teacher social interactions and academic engagement (Allen et al., 2018). Other research has highlighted factors including environmental affordances, and the mental health and personal attitudes of individual students (Ahn & Davis, 2020a). Explorations of these factors often include behavioral indicators. For example, in a case study of Biology majors, Knekta and McCartney (2021) found that participation in research programs which provide additional opportunities for faculty interaction led to increased belonging for some students. In a study of faculty/staff interactions, Kim & Lundberg (2016) found that students' sense of belonging increased when they perceived

their instructors as friendly - while perception itself may not be classed by some as behavior, it is likely that this perception is shaped by the observation of faculty behavior (e.g: smiling, name recognition, etc.).

The Stakes of Belonging

In higher education, increased sense of belonging is known to carry benefits for students. sense of belonging is most commonly linked to university retention and persistence (Tinto, 1987; Suhlmann et al., 2018; Pedler et al., 2021). It can also impact the likelihood of entering certain majors (Rainey et al., 2017), and can impact per-course academic performance (Edwards et al., 2022). It has been linked to success in self-regulated learning (Won et al., 2018), as well as motivation (Gauder-Diaz et al., 2019) and overall mental well-being. In short, students who report higher levels of belonging are more likely to engage with coursework and be successful in doing so than their peers, and are more likely to graduate within their expected time frame.

There are consistent patterns in how students or groups of students experience belonging differently. First-generation students commonly report lower levels of belonging than peers (Museus & Chang, 2021), as do students of lower socio-economic status (Ahn & Davis, 2020b). Historically marginalized students, in particular, commonly report lower levels of belonging than peers. Research has identified lower levels of belonging among Black and Hispanic students (Gopalan et al., 2020; Duran et al., 2020), LGBTQIA+ students (Wilson & Liss, 2022), and students with disabilities (Vaccaro et al., 2015). Attendance modality can also be a factor shaping modality, with online-only students generally reporting lower levels of belonging (Peacock et al., 2020). Offices which support student groups experiencing lower levels of belonging (e.g: Disability Resource Offices, Cultural Offices), may find particular value in identifying specific behaviors which support belonging for their students.

"Doing Belonging"

In sociology, the idea that belonging can be shaped by the behavior of individuals has been expressed as "doing belonging" (Polat, 2022). In this view, belonging is a process that can be co-created through interaction between the individual and their community (p. 40). In addition to systemic factors, this view of belonging assumes its capacity to be shaped by the behavior of individuals. In the context of migration, as an example, expression of identity and steps taken to assimilate can mitigate community belonging (Skrbis et al., 2007). It is worth noting that, in this context, belonging is not inherently positive. Efforts taken to assimilate can create distance from a tightly-held cultural identity, which can create complex internal conflict (Spickard, 2013). Overall, this view of belonging is compatible with that held in education. Like Walton and Brady's definition, sociologists define belongingness through the lens of the relationship between self and context, though their context would be a broader, politically-constructed society rather than a specific educational setting (Yuval-Davis, 2007; May, 2011).

The concept of "doing belonging" has begun to be applied in educational research. Puskás (2016), seeking to study refugee students transitioning to educational settings in a new country, found that supporting preschoolers in learning the steps of a common Swedish preschool song supported their classroom belonging. Pesonen et al. (2020), in an evaluation of factors shaping Autistic students' sense of belonging in Finnish universities, cited "doing belonging" in their evaluation of the behavioral components shaping faculty-student relationships. The term has yet to find major footholds in educational research in the United States – however, it may serve as a valuable framework, should sufficient behavioral elements be identified which consistently influence sense of belonging.

Methods

Selection Criteria and Search Plan

The goal of this review was to identify high-level trends and patterns related to belonging within the literature. Therefore, rather than systematically assessing all possible literature on the topic of belonging, the decision was made to conduct an open search within the literature, following the search criteria below, until saturation was reached.

Articles were searched in the Academic Search Complete database, using the following search terms: (Sense of Belonging) AND (Postsecondary Education) – 138 results found, 28 articles met criteria, (Sense of Belonging) AND (Higher Education) – 430 results , 95 met criteria, (Sense of Belonging) AND (College) – 1,229 results, 83 added to review. Duplicates identified within all searches were removed. A fourth search, (Sense of Belonging) and (University) was initiated, but when no new articles were identified within the first ten pages of the search, it was determined that saturation had been reached. Synonyms were used for "higher education" to ensure a breadth of responses. Initially, searches including synonyms or alternatives for sense of belonging were planned. However, an initial search for (Belonging) and (Higher Education) produced primarily articles which did not meet search criteria, so these searches were abandoned. A total of 150 articles were found at the time the search was discontinued. A full list of all included articles is available in Appendix B[**D**].

For the purposes of this review, only articles published in English, reflecting research on US colleges or universities, and published after 2010 were included. International articles were excluded for the purposes of generalizability – given the dramatic difference in institutional context, behaviors supportive of belonging internationally may not support students within the context of US colleges or universities. Articles which did not appear to reference sense of belonging were excluded from the review.

Of the 150 articles initially selected, half were excluded (75) for the following reasons:

- Articles contained insufficient reference to belonging (only within literature review, 10 or fewer mentions)
- Articles assessed the correlation of belonging to other constructs (e.g: self-efficacy)
- The research team did not have access to the article

The majority of articles excluded were excluded because, while they provided useful information on belonging, they were providing a correlation between belonging and other constructs (e.g: suicidality, self-confidence, body image), rather than any behavioral elements.

Analytical Framework

The following sections will detail the findings of our review of the literature. Each article not excluded was read thoroughly, with attention to specific behaviors performed by students, faculty, or at the institutional level which were found (or were shared by students) to improve sense of belonging. Behaviors were organized into "response classes" – categories of behavior based on context, and both the response classes and specific behavioral examples were counted and organized in tables for students, faculty/staff, and institutions. Only behaviors found within at least four studies are included in tables and discussion, though some specific examples of behaviors mentioned less frequently are highlighted.

The selection of this cutoff was made based on trends within the accumulated literature. Many of the studies included occurred at specific institutional contexts (e.g: Historically Black Colleges and Universities, Community Colleges, members of the Christian Council of Colleges and Universities) where institutional factors may make it difficult for results to be meaningfully transferable to dissimilar contexts. The cutoff of four articles helped to ensure that behaviors

included in the chart included articles from multiple institutional contexts, ensuring more generalizable results. Notably, the totals for each category shown on the charts include all identified behaviors, including those falling below the cutoff for inclusion in the chart by name.

This review includes a mix of quantitative, qualitative, and mixed methods studies. A small number of studies found within the review synthesized multiple studies, or included review of the literature – where a systematic methodology was applied, these were retained if behaviors could be identified from that review. In total, three mixed methods studies, 24 qualitative studies, and 32 quantitative studies were included. 5 review articles were included, which themselves summarized or reflected the results of both quantitative and qualitative studies. Of note, the majority of articles excluded were quantitative studies, generally due to their focus on correlation rather than assessment of the impact of an intervention or identifiable behavior.

Many of these studies offered qualitative descriptions of context or behavior supporting belonging in addition to identifying the behaviors themselves – in other words, adjectives or contextual descriptions which may also be of value to researchers or practitioners. These are also included in the summary tables and discussions.

Findings

The following sections summarize what was learned from this review of the literature. In the articles comprising this review, various behaviors as performed by students, faculty, staff, and behaviors at the institutional level were identified. These will be discussed separately. A small number of behaviors were identified for each group as contributing to reductions in reported belonging, which are discussed separately. For each category, we have also tracked commonly-used qualitative descriptors of the behaviors and interactions within the literature, which can provide additional contextual insights as to the performance of supportive behavior.

Student Behavior

Table 1 below summarizes trends in the literature regarding student behavior which contributes to increases in their self-reports of sense of belonging.

Table 1	***Student Behaviors that Support Increased Sense of Belonging***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Faculty Interactions		**38**	Interested, Empathetic, Supportive,
	Mentoring	10	Caring, Understanding, Aware
	Office Hours	6	
	Resource Seeking	5	
	Research Engagement	5	
	Class Participation	4	
Peer Interactions		**31**	Community, Trust, Social, Connected,
	Study Groups	8	Close, Friendly, Supportive
	Cohort Programs	4	
	Peer Mentoring	4	
Student Organizations		**27**	Community, Supportive, Opportunity,
	Student Leadership	8	Identity
	Athletics	6	
	Greek Life	5	
	Service Organizations	4	
Campus Engagement		**22**	Supportive, Available, Understanding
	Use of Resources	7	
	Identity Centers	13	
Community Engagement		**13**	Community, Identity, Engaged
	Service Learning	4	

*Figure 3: Student behaviors contributing to belonging (also available full size in Appendix A[**C**])*

Overall, engagement with faculty (38) and peers (31) were the most commonly identified broad categories of behavior linked to improved sense of belonging among students. Participation in student organizations (27) was also prevalent, as was campus engagement (22). A smaller number of studies (13) described behaviors connecting students with their larger community (e.g: local resources, families, local culture) as supportive of belonging.

While some studies assessed these connections at too great a scale to identify specific student behavior within these categories that would contribute to belonging, some smaller studies or qualitative studies provided specific examples of behavior which contributes to belonging.

Engagement with Faculty

Ten studies identified students engaging in mentor relationships with faculty as supportive of belonging. Ahmed et al. (2021), for example, found that first-generation students in STEM courses reported a higher sense of belonging when they worked with faculty mentors, which also contributed to greater confidence in their academic performance and retention within the major.

Six studies identified the act of visiting faculty during office hours as a contributing factor to improved sense of belonging. Five studies identified that students who proactively approached faculty or staff to seek resources (such as scholarships, tutoring, and other forms of support) reported higher levels of belonging. Gillen-O'Neel's 2021 study of belonging in first-generation students, for example, found that help-seeking behaviors such as asking about available resources and attending office hours were connected to improved sense of belonging.

Five studies found that students who engaged in research activity within their courses experienced greater sense of belonging. Rivera & Núñez (2022) found that providing opportunities to engage in research was one of the "most transformational practices" (p. 4) supporting belonging for students at the consortium of Hispanic Serving Institutions they studied, and made a positive impact for Computer Science students.

Four studies identified class participation (itself a broad category which can include asking questions, volunteering answers, engaging in class discussion) as a behavior which

supports sense of belonging. In Cook-Sather and Seay's (2021) study of pedagogical partnership opportunities, they found that Black female students developed greater sense of belonging in the classroom, and in some cases at the university as a whole, when provided this format which encouraged regular class discussion and direct engagement with teaching faculty.

Trends in Qualitative Description. In describing behaviors in this category, a number of qualitative patterns emerged which are worth noting. Student-faculty interactions which support belonging are commonly described as supportive. Students described faculty they had positive interactions with as empathetic, interested in them, aware of their needs. It is difficult to assess these descriptors objectively, but it is critical to note that behavior is also dependent upon the quality of performance. In order for students to benefit meaningfully from office hours, as an example, faculty may need to behave in ways which signal this empathy, interest, and awareness.

Engagement with Peers & Social Organizations

Eight studies highlight student participation in group study with peers, formally or informally, as supportive of belonging. A number of Blalock et al.'s (2021) case studies of diverse students in medical school during the pandemic described holding group study over zoom, which helped them feel connected to the university during that turbulent time.

Four studies described a benefit to belonging for students who had enrolled in some form of cohort-based programming, whether through their major, or identity-based. Kezar et al. (2020) described numerous distinct benefits for students participating in a Comprehensive College Transition programming, shown in two separate cohorts of students.

Four studies described positive trends in belonging stemming from peer mentoring for students, both from serving as a peer mentor and from working with a mentor as a mentee.

Brooms' (2020) study of peer mentorship within Black Male Initiative programs found that these programs improve sense of belonging for both parties engaging with them.

A variety of articles cited the value of joining student organizations (clubs, societies, teams, etc.) as beneficial to belonging. Having the opportunity to serve as a leader in such organizations was specifically called out as beneficial in eight articles. Harrel-Hallmark et al's (2022) study of first-generation students joining Greek life organizations found that "new members who assumed leadership positions or assume any responsibility cited a greater sense of belonging" (p. 66). Membership in Greek life in general was found to be beneficial to student belonging in five articles. A number of specific categories of student organization were shown to be beneficial, including athletic organizations (6) and service organizations (4). A smaller number of studies reported similar benefits from professional and academic societies, music groups, and other more specific student organizations

Trends in Qualitative Description. In describing interactions with peers, a number of qualitative trends were prevalent in the literature. These relationships were often described as close or supportive. Student organizations created an opportunity for students to build community, or to connect with others who shared their identity. While it is difficult for institutions to shape the nature of interactions between students to align with these values, in the lens of student organizations, this may be useful in guiding standardized expectations of organizational code of conduct at institutions who want to ensure clubs and societies are supportive, and provide consistent opportunities to build greater sense of belonging.

Engagement with Campus and Community

Engagement with campus resources was highlighted in seven articles. Campuses provide many distinct resources to students, including offices providing tutoring services and other forms of academic support, scholarships, and financial aid. Ensuring student knowledge of these resources and supporting engagement with them is critical. In Scoulas's 2021 study of library use among students, for example, it was found that students who remained engaged with library services during the pandemic reported greater overall sense of belonging.

Four articles identified engagement with community service as supportive of belonging. Hoffman's 2012 article on the subject found a link between service to the community and belonging to the community, which can contribute to greater sense of belonging within the university itself.

Trends in Qualitative Description. In describing campus and community, the most common qualitative trends were around engagement, identity, and support. Again, ensuring that the staff which support these resources, and guide service learning and other community engagement, are trained and prepared to provide supportive environments which respect student identity is critical to ensuring that students who engage in these behaviors experience the expected result of improved sense of belonging.

Behaviors That Reduce Belonging

It is worth noting that many of the behaviors listed as supportive behaviors may provide an indication of corresponding or opposing behaviors which would reduce belonging. Given the value of class participation, as an example, students who are more frequently absent may report lower belonging. Universities seeking to shape belonging should attend to these patterns, and find means of encouraging students to engage in these behaviors

In terms of behaviors actively reducing belonging, some articles (2) highlighted extensive social media use by students as corresponding to lower levels of sense of belonging.

Faculty and Staff Behavior

Table 2 below summarizes trends in the literature regarding faculty behavior which contributes to increases in their self-reports of sense of belonging. Overall, the literature reports fewer examples of specific faculty or staff behavior which supports belonging, which may indicate an opportunity for further study.

It is important to note that many of the behaviors identified as supportive for faculty and staff are reciprocal with student behavior discussed in the above section (e.g: mentoring relationships). Where there is repetition, the items are included in the survey, but will not be discussed in both sections.

Table 2	***Faculty/Staff Behaviors that Support Increased Sense of Belonging for Students***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Out of Class Interaction		28	Supportive, Attentive, Aware,
	Mentoring	10	Encouraging,
	Office Hours	6	Knowledgeable
	Proactive Outreach	5	
	Recognition out of Class	4	
Within Class Interaction		14	Supportive, Encouraging, Trust,
	Collaborative Classrooms	7	Attentive, Available, Understanding,
	Course-Based Research	5	Empathetic, Caring, Interested
Resource Sharing		10	Supportive, Helpful, Attentive
	Financial Resources	4	
DEI Commitment		8	Supportive, Identity, Kind,
	Identity-Affirming Statements	4	Understanding
	Inclusive Language	4	
	Diverse Examples	4	

*Figure 4:Faculty & Staff behaviors contributing to belonging (also available full size in Appendix A[**C**])*

Overall, behavior out of the classroom was the most commonly cited response class, with 28 examples in the literature. This is indicative of the simple availability of the opportunity to

interact with faculty outside of class exerting a positive influence on belonging. Within-class behavior was identified as important in 14 cases, resource sharing (sometimes in a syllabus, sometimes in 1:1 interactions) in ten, and commitment to DEI in eight.

While some studies assessed these connections among too many participants to readily identify specific behavior within these categories that would contribute to belonging, some smaller studies or qualitative studies provided specific examples of behavior which contributes to belonging.

Out of Class Behavior and Resource Sharing

Four studies highlighted the importance of simply being recognized and acknowledged by faculty and staff outside of class as supportive of student belonging. Alcantar and Hernandez (2020), for example, found that these out-of-class interactions between faculty and students were supportive of belonging for Latina/o students at the universities they studied.

Five studies identified proactive outreach from faculty to students as supportive of growth in student belonging. Cooper and Newton's 2021 study of Black female athletes at HBCUs found that this proactive support, particularly outside of class, was frequently shared by students as supportive of their sense of belonging. One athlete described working with a staff member who had, on learning which majors she was interested in "made sure [they] met the dean of the department and she kind of just made [them] feel like it was going to be the best place for [them] to go to school." (p. 77).

A major theme in the literature was the value of sharing resources with students, a behavior which was found among both faculty and staff to support belonging. Ten articles identified this theme, with four specifically highlighting the importance of sharing financial

resources (e.g: scholarships, financial aid). A number of resources were indicated as important in individual articles, including tutoring, research opportunities, internships, and within-major resources. Hotchkins et al. (2021), for example, found that staff connecting Black Community College students with resources – not only on campus but in the community – was among the most significant factors connected to their sense of belonging.

Trends in Qualitative Description. In describing behavior of faculty and staff outside of the classroom context, the literature emphasizes qualitative descriptors including supportive, knowledgeable, and aware. Being able to view faculty and staff as resources themselves, with knowledge on policy (as highlighted in Daniels et al. [2021]) and available local resources, is critical. Supplying this information proactively is key, as it may help provide this support to students who may not yet be exercising strong help-seeking behavior.

Within-Class Behavior and DEI Commitment

A number of studies identified the behavior or pedagogical approaches of faculty within the classroom as connected to student belonging, with a few specific behaviors identified as supportive. Seven articles identified the implementation of collaborative classrooms as supportive of belonging. In these environments, students play a partial role in designing the syllabus, or collaborate closely with peers in a supported, structured environment. Chang et al.'s 2019 study of university programs supporting belonging and other success outcomes, for example, found that a number of programs which encouraged these pedagogical approaches were successful at increasing student belonging.

Faculty support for diversity and equity, as visible within the classroom, was a common theme in the literature – particularly that focused on students from marginalized identity groups.

A number of specific examples of behaviors which communicated support for student identity and diversity were found in the literature.

Four articles cited the importance of identity-affirming statements, either verbalized during class or shared as part of a syllabus. Four articles shared the value of diverse examples (e.g: including diverse gender, race, cultural expression in both images and narratives shared in class), and inclusive language (e.g: being inclusive with use of gendered language) in supporting student belonging.

Trends in Qualitative Description. Themes in qualitative description of behaviors in this category include supportiveness, trust, kindness, and empathy. Attention to these kinds of details in the classroom, whether by practicing inclusive teaching or empowering students to engage in collaboration in a level playing field, may also be reliant on the demeanor and attitude of the instructor. Alternatively, engaging in these behaviors may in fact shape student perceptions of the demeanor of their professors, even when their level of interaction is low.

Behaviors That Reduce Belonging

As with students, some behaviors in opposition to those identified here may lead to reduction in belonging for students interacting with faculty and staff. For example, faculty who encounter students outside of class but do not recognize or engage with them may have a negative impact on those students' sense of belonging at the university.

A clear example of this, present in the literature, is that encountering faculty who engage in racist behavior or microaggression against minoritized students in their courses will lower sense of belonging for those students. This was identified in six articles within the review.

Institutional Behavior

Finally, the third table below categorizes institutional behaviors found in the literature to be supportive of belonging. Institutional behavior is complex, but should be understood to result from a network of behaviors performed by individuals within the institution - it can also comprise policies, procedures which both result from the behavior of individuals and codify the expected behavior of other individuals across the campus.

For example, providing access to scholarships relies on the securing of funding, the broadcasting of information, and the decision of how to provide scholarship funds – all of which result from the behavior of one or more individuals.

Table 3	***Institutional Behaviors that Support Increased Sense of Belonging for Students***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Identity-Based Resources		31	Welcoming, Diverse, Inclusive, Community
	Identity Centers	13	
	Identity-Affirming Programming	12	
	Professional Development on DEI	4	
Supportive Programming		24	Welcoming, Supportive, Available
	Peer Mentor Programming	4	
	Transition Programming	8	
	Live/Learn Communities	7	
Support for Student Access		18	Accessible, Supportive
	Financial Resources	4	
	Direct Identity-Based Support	5	
	Public Resource Information	5	
Community Building		16	Community, Welcoming, Engaged, Exciting, Fun
	Res Hall Programming	6	

*Figure 5: Institutional behaviors contributing to belonging (also available full size in Appendix A[**C**])*

Within institutional behavior, the establishment, support and continued promotion and execution of identity-based resources is the most consistently identified theme, mentioned in 31 articles. 24 Articles mention other forms of supportive programming, 18 other forms of direct student support, and 16 various methods of building community.

Within institutional behavior, it was more likely for behaviors identified to support belonging to be tied closely to institutional context. For example, Daniels et al.'s 2021 study of minoritized students at smaller Christian universities found that the visibility of senior leadership (provosts, deans, and the university president) was a factor supportive of belonging for these students – this may prove more difficult at larger universities, where it would be impractical for senior leadership to be regularly seen by large portions of the student body. Community building as a theme is full of such examples, with only the availability of residence hall programming being consistently identified within the literature.

Identity-Based Resources

The establishment of identity centers and support for identity-affirming are two of the most overall prevalent themes within the literature, as factors supporting the development of student sense of belonging. 13 articles cited the value of identity centers (e.g: multicultural student centers, Indigenous student centers). In Bucy's 2022 study of Indigenous university students, their engagement with an Indigenous identity center at their university was the most consistently-identified factor supporting their belonging, with some students sharing that it was the primary reason they remained at the university.

Identity-affirming programming is also critically important, as cited in 12 studies. In Banda and Flowers's 2020 study of Latina engineering students, university-sponsored programming which affirmed and highlighted their culture was shown to support student engagement with organizations, activities, and their overall sense of belonging.

Other studies found that institutional support for identity could be approached through support for faculty. Given the importance of faculty support for DEI, as shown above, it is

unsurprising that institutional support for professional development on DEI and sense of belonging are both found in the literature, in four studies, to correlate with improved sense of belonging for students at institutions which engage in this behavior.

Trends in Qualitative Description. Themes in qualitative description of these resources include diversity, inclusiveness, welcoming and community. Ensuring the availability of these resources is paramount to providing pathways to belonging for students who are part of the identity groups they serve.

Support for Students

Programming supporting students' needs outside of cultural identity is also commonly found to support a sense of belonging. Live and Learn communities, which take many forms at different universities, and might be focused around majors, cultural identities, or other factors, were found to support belonging in seven articles within the literature.

Support for college transition was found to support a sense of belonging in eight articles in this review. Abrica et al.'s 2022 study of a Minority Retention Program designed to support Latino Male students in STEM found that support for these students' transition to college was particularly supportive of both their success outcomes and sense of belonging, for example.

As shown in both the student and faculty sections above, the availability and accessibility of resources on campus – academically, financially, and socially – are heavily tied to student belonging. Five articles in the literature emphasized the importance of having resources in these categories tailored to the needs of students from distinct cultural or other identity backgrounds (e.g: making things available in multiple languages, scholarships for first-generation students) and for ensuring that information about these resources is publicly available to support access.

Trends in Qualitative Description. Themes in qualitative description of behaviors in this category include welcoming, available, accessible, and supportive. By making these key resources available to students, universities can help signal to them that they want them to feel welcome, and that their campus is a space where students have the opportunity to belong.

Behaviors That Reduce Belonging

Within institutions, racism and microaggressions are the most consistently-identified barriers to student belonging, with these factors highlighted in seven articles within the literature. This can take many forms, but some articles specifically call out failure to higher diverse faculty and staff, failure to highlight diversity in promotional materials, or barriers to accessing key campus resources as places where their sense of belonging at their university broke down.

Implications and Conclusions

The most visible trends in all categories of this review are tied heavily to identity. Identity-affirming programming, identity centers, identity-based cohorts, inclusive classroom language are all found consistently to influence belonging for many different groups of students. For students from marginalized backgrounds, it is critical that universities provide these resources, and support for their access.

Another consistent trend is the importance of what goes on outside of the classroom. Among students, this can be engagement in extracurriculars, engaging with peers in group study, or maintaining faculty relationships outside of class. In order for this to be possible, however, faculty must be available to students outside of class time. In order for this to be possible, institutions may need to assess whether faculty have appropriate resources – faculty who are

heavily scheduled are less likely to have time to have consistent office hours, denying this opportunity for belonging.

Within an environment as large and complex as a university, the behavior of these three groups is inextricably linked. Some who study behavior may be familiar with the model of Antecedent-Behavior-Consequence – that all behavior is shaped by the events which precede it and the consequences which follow it. In the context of a university, the behavior of the institution often serves as antecedent for the behavior of the faculty and staff, which serves as antecedent for the behavior of the students. The behavior of students which is found in the literature to support belonging is only possible, in many cases, in the context of the corresponding faculty behavior or institutional behavior.

This is particularly evident in the context of identity centers, which play a key role in the literature and are consistently found to support greater belonging for students. On a student level, this is reliant on engagement. It is difficult for these centers to support students who do not interact with them directly, and students must take some form of leadership in this. However, faculty and staff can encourage this by sharing information or even encouraging students to engage with these resources, and institutions can ensure that these resources are accessible, prominent, funded, and that as many members of the community as possible know they are there, and know they are valued.

This interchange between student, faculty, and institutions is also at play in smaller, more measurable forms of behavior. Engaging in research activity can improve student belonging, for example – in order for the student to have the opportunity to engage in this behavior, faculty must take specific steps to create and sustain that opportunity. Institutions may be able to provide support for these opportunities, either through funding or administrative coordination.

Ultimately, institutions seeking to support a sense of belonging for students may want to begin by understanding the behaviors they hope to see their students to engage in – accessing resources, working closely with faculty, collaborating with peers, taking advantage of campus resources. In order for students to engage in these behaviors, faculty and staff must know how to provide environments where these behaviors are not only possible, but encouraged. In order for faculty and staff to do this, institutions must make belonging a priority, and providing training, resources, and opportunity for these behaviors to occur. Put more simply – students' sense of belonging is a responsibility shared by every member of the university community. We must begin to recognize it as such.

Acceptance and Commitment Training to Support Flexibility & Belonging

for College Students with Disabilities

Abstract

Sense of belonging is a commonly-referenced construct in educational literature that has received comparatively little attention in behaviorally-aligned research. This multiple-case study serves to explore the applicability of Acceptance and Commitment Therapy (ACT) in the support of college students with disabilities, with the goal of supporting sense of belonging.

Four participants each engaged in a four-session ACT intervention focused on the development of strategies to build strength and confidence managing academic stress. In this mixed methods study, data was gathered from participant quotes transcribed during sessions, analysis of psychological flexibility, and survey data before and after the intervention. Particular focus was given to the social validity of ACT in the support of this population.

Keywords: sense of belonging, disability, acceptance and commitment training, higher education, mixed methods research, social validity

Acceptance and Commitment Training to Support Flexibility & Belonging for College Students with Disabilities

The evidence base of Acceptance and Commitment Therapy (ACT: Hayes et al., 1999) has developed across nearly forty years, with over 900 randomized control trials conducted with a collective *n* over 50,000 (http://bit.ly/ACTRCTs). Of these, over 50 studies have focused on the support of college students, including Self-Identity (Yin, 2022), emotional regulation (Ritkumrop et al., 2021), perfectionism (Kang & Song, 2020), and smartphone addiction (Yu & Son, 2016). It has frequently been applied in the context of supporting individuals with disabilities, including chronic pain (Yadavari et al., 2021; Casey et al., 2022) and learning disability (Narimani & Taherifard, 2019; Pourtlaeb et al., 2021) in addition to the treatment of anxiety, where initial systematic reviews have identified ACT as a "promising" treatment (Swain et al., 2013).

Throughout this literature base, there is not a single study which explicitly looks at the applicability of ACT to support belonging. This is particularly surprising given ACT's applications in education, where the concept of Sense of Belonging (see: Strayhorn, 2018) is a focus of considerable research and discussion, and where interventions targeting belonging have been demonstrated to shape retention and academic performance (Pedler et al., 2021). There is some logic to the supposition that ACT could be efficacious in support of belonging. Belonging is argued to be a fundamental human motivation (Baumeister & Leary, 1993). Sense of Belonging is commonly discussed in terms of social connectedness (Allen et al., 2018), and ACT has often been applied successfully to support social anxiety (e.g: Krafft et al., 2020; Lee et al., 2021). It has also been linked to self-satisfaction and identity (Ahn & Davis, 2020), in a manner compatible with ACT's view of psychological flexibility. This study seeks to provide a

preliminary exploration of the Applicability of ACT to support the development of Sense of Belonging.

Brief Review of Literature

Sense of Belonging

Sense of Belonging is commonly described as "students' perceived social support on campus" (Strayhorn, 2018, p. 4), or as the "perceived fit between the self and a context" (Walton & Brady, 2017). Students who report stronger sense of belonging are more likely to remain enrolled at their universities (Pedler et al., 2021), and have been found to demonstrate higher levels of academic motivation (Suhlmann, 2018). In some cases, the degree to which students experience belonging has been shown to impact within-class performance (Cox et al., 2022). Broadly, the literature indicates that students who report a stronger sense of belonging to their educational environment are more likely to thrive there (Allen et al., 2018).

Belonging can vary significantly based on a student's program of study (Ahn & Davis, 2020a), their socioeconomic status (Ahn & Davis, 2020b), or even the modality by which they take courses (Peacock et al., 2020). Students from historically marginalized backgrounds tend to report lower levels of belonging than peers, including students of color (Gopalan et al., 2020), LGBTQIA+ students (Vaccaro & Newman, 2017) and students with disabilities (Gur & Bina, 2022). Research into belonging for students with disabilities, in particular, has emphasized the importance of functional social skills such as self-advocacy (Vaccaro et al., 2015; Y. Teng et al., 2020), which can empower students to form more effective relationships with faculty.

Models of belonging commonly account for social interactions, including with faculty, as well as academic identity, and the cultural environment around students (Allen, 2018). Newer

models of belonging have also emphasized the role of students' sense of "self" in shaping their experience of belonging (Allen et al., 2018; Ahn & Davis, 2020a). This has, in part, contributed to the reliance on the phrase "doing belonging" (e.g: Pesonen et al., 2020), which has its origins in sociological writings on belonging (Yuval-Davis, 2007; May, 2011), to describe the actions which students or faculty take which can aid in or hinder the development of Sense of Belonging. This framework may pave the way for increased consideration of the independent, behavioral self-regulation of belonging, for which structured interventions such as ACT may be well suited.

Model of Belonging

Ahn & Davis (2020a) provide a model of belonging which includes 4 domains:

- Academics: Faculty/Staff Interactions, Rigor, Curriculum
- Social: Peer Interactions, Clubs, Events, Community
- Environment: Physical space, cultural climate, accessibility
- "Personal Space": Self Satisfaction, Identity, 'Self'

These domains were identified through in vivo coding of belongingness themes identified by college students at a university in the United Kingdom (n = 426). Of these 4 themes, social connectedness was identified most frequently (1,289) by far, with academic and "personal space" domains relatively close as second and third (541, 464) respectively. These domains are consistent with other efforts to quantify factors influencing belonging (Allen et al., 2018; Teng et al., 2020), and may be well linked to psychological flexibility as understood within ACT.

Acceptance and Commitment Therapy

ACT has, in the past, demonstrated efficacy in the support of college students. Online modules providing ACT intervention were found by Chase et al. (2013) to support college students' academic performance (GPA). Mullen et al. (2020) found live ACT & Yoga workshops to be effective in reducing psychological distress, and Scent & Boes (2014) found it effective in reducing procrastination behaviors within this population. These successes could be argued to correspond to the domains of belonging identified by Ahn & Davis (2020a). ACT interventions which reduce procrastination may, as an example, indirectly support Sense of Belonging by improving academic performance and confidence, and improving students' sense of mastery over the student role (Vaccaro et al., 2015).

ACT argues that people suffer unnecessarily when their behavioral repertoire is narrowed by adherence to verbally-constructed rules (Hayes et al., 1999, p. 66). The alternative to this rigidity is psychological flexibility, a set of six distinct processes including Acceptance, Defusion, Present Moment Awareness, Self-as-Context, Values, and Committed Action (Hayes et al., 2013). We posit a number of ways in which dimensions of flexibility may intersect with the most prevalent of Ahn & Davis's (2020a) domains of belonging:

	Academics	Social	"Personal Space"
Acceptance	Students may report greater belonging if they 'accept' the emotional burden of a difficult course	Students may report greater belonging if they 'accept' emotional content from poor peer interactions	Students may experience a higher quality of life if they become more Accepting (Yin, 2022)
Defusion	Students may engage more readily if they defuse from rules such as "my professor is too busy for me"	Students may have better peer connections if they defuse from rules such as "I can't talk to that person"	Defusion may help students combat negative self-referential thoughts (Lavelle et al., 2021)
Present Moment Awareness	Attending to present rather than external stimuli may help students	Students may connect better with peers if they are more present with them	Mindfulness may reduce distress and reduce stress in day-to-day life

	better notes (Karunananda, 2016)		(Küchler et al., 2022)
Self-as-Context	Awareness of self may improve belonging by distancing students from self-directed rules	Awareness of self may improve peer-to-peer relationships	Students may benefit from contact with their transcendent "noticing" self (Hayes et al., 2001 p. 245)

Figure 6: Table summarizes domains of belonging (see Ahn & Davis, 2020)

The overall goal of ACT is to encourage routine engagement with committed action that is consistent with one's values – in the context of belonging, helping students identify the values that led them to enroll in their university of choice and encouraging committed action may lead to belonging through increased social engagement or academic achievement.

Acceptance and Commitment Training

On a college campus, there are limited resources which would be able to provide ACT in a clinical therapeutic context. Some studies have addressed this barrier by focusing on online platforms (e.g: Chase et al., 2013; Räsänen et al., 2016), but another alternative may be Acceptance and Commitment Training (ACTraining: Dixon et al., 2020; Tarbox et al., 2020). ACTraining is an umbrella under which non-clinical applications of ACT can be considered . Tarbox et al. (2020), in their review of the topic, cited nursing, occupational therapy, dentistry, and education as disciplines where this model has shown success. The authors also highlight some examples of when their audience (board certified behavior analysts) may need to refer to a ACT practitioner who is licensed to provide psychotherapy. A helpful exemplar is discussed, of an autistic student receiving social skills training: as ACTraining, a practitioner without clinical training might focus on social skills, incorporating ACT components including mindfulness to

support skill growth (Tarbox et al., 2020). ACTraining is not designed to directly address or support symptoms of depression, in other words, but support practical skill development.

ACTraining is compatible with the study of belonging in the context of support of behaviors linked to belonging within the identified domains. It is often administered as a brief single or multiple-session intervention as a component of a larger behavioral intervention. For example, ACTraining could support students in engaging more consistently with studies, attending class more regularly, taking more accurate notes, etc. Within this study, ACT was delivered as ACTraining in a brief (four sessions of 30 minutes each) intervention, provided by a trained BCBA within the context of a university disability resource office.

The Current Study

The purpose of this study is to provide a preliminary exploration of the applicability of brief ACTraining in a Student Affairs context to support the Sense of Belonging and psychological flexibility of college students with disabilities.

Research Questions

Through a mixed-methods, multiple case study of a small sample (n = 4) of college students with disabilities, this study seeks to address the following questions:

RQ1: How does brief ACTraining impact the psychological flexibility of students with disabilities?

RQ2: How do students with disabilities describe their Sense of Belonging to their university?

RQ2a: Do these descriptions change in response to the brief ACTraining intervention?

RQ3: To what degree do changes in psychological flexibility correspond to changes in reported Sense of Belonging?

Methods

This mixed methods study incorporates several data sources in service of understanding the student participants' belonging behaviors as a unique act in context, using a fully mixed concurrent equal status design (Leech & Onwuegbuzie, 2007).

Student participants completed a brief survey before and after the intervention, which included both Likert-scale and open-ended responses. Surveys were completed online, using the RedCAP survey platform. Within-session, data was collected on flexible and inflexible statements, providing both behavior count data and qualitative data. Sessions were initially recorded, transcribed, and recordings were destroyed upon transcription to protect participant confidentiality. Assessment of statement flexibility, and qualitative analysis of within session data, occurred after conclusion of study through direct analysis of transcripts.

All participants were given the option of providing their own account of their experience with the intervention, contributing both member-checking of researcher-driven analyses and their own direct qualitative account of their experience. No participant elected to participate in this manner (in part, this may be due to the timing of this outreach over the Summer, though other factors may be at play).

Participants

Recruitment for this study occurred in the first week of the Spring semester. Initially, an email was sent to all students registered with the disability resource office at a large university,

and then prospective participants who responded to the initial recruitment email were screened based on the following criteria:

1. Participants must be undergraduate students
2. Participants must not be currently on the administrative caseload of the interventionist

Additional consideration was given in selection to participants who identified feelings of social isolation or disconnectedness that would be consistent with an overall low sense of belonging.

Participants were excluded from this study for failing to meet the above criteria, or for the following reasons

1. Participant is unable to provide informed consent (this study requires a high degree of participation, and assent would be insufficient).
2. Participant has limited language or communication ability (ACT is very language based, and reliant on communication skill).

Intervention

The intervention took place across four weekly sessions. The first three sessions were to correspond to one of the three dimensions of ACT (and a corresponding two dimensions of psychological flexibility), with the fourth serving as a holistic overview of previous sessions. The intention was for the intervention to take place across four continuous weeks – in the event of rescheduling, this window extended. Within most sessions, participants were able to select from a list of options within each ACT activity category – a complete list of activity options, and

descriptions of activities, is included in Appendix C[**G**]. Each session was scheduled to last 30 minutes. The rough breakdown of that time was:

- First Five Minutes: A brief discussion of student's progress, how classes are going, thoughts on intervention thus far
- Next 10 Minutes: First Activity
- Next 10 Minutes: Second Activity
- Final Five Minutes: Interview on Belonging

The initial check in during each session also serves as an opportunity to ascertain ongoing consent, and an informal assessment of social validity.

Single Case Design and Analysis

The single case elements of this mixed methods design occurred within the intervention phase. Sessions were recorded – these recordings were transcribed – initially by an AI tool, with corrections made by the researcher to ensure accuracy, and deleted to protect participant confidentiality. Individual sentences, or in the case of longer run-on sentences, clauses, were coded as either flexible or inflexible. The total counts of flexible and inflexible statements for each session were graphed, and visually analyzed for level, trend, and variability.

Statements were considered for flexibility and inflexibility in alignment with the six domains of ACT. Examples of flexible/inflexible statements are shown in the table below, aligned with domains of psychological flexibility which were addressed within the intervention:

	Acceptance	Defusion	Self-as-Context	Present Moment Awareness
Flex	*"At this point, there's nothing I can do. It's out of my hands. Like, yeah, I'm just*	*"Even if you're saying, like, I can't do this, but you can still physically do it. And it doesn't*	*"I've got it right here [pointing to brain]… "I am not dedicated enough… I know it's not true,*	*"During my friend's birthday instead of worrying about how much work I had… I felt like I was*

	gonna have to deal with it."	*change the fact that you have the thought."*	*like, of course, but it's still a lot to hear."*	*more present in the moment to spend time with her."*
Inflex	*"I get frustrated after a while with the stress. I just… I can't explain the problem and therefore cannot solve the problem."*	*"I feel like I have to punish myself sometimes. It's like, okay, if it's gonna be bad then it's gonna be really bad."*	*"I've never been that great of a writer…I'm better with definitive answers. So, like, yeah, I think I try to avoid it as much as I can."*	*"When I get stressed, my brain forgets things that are not written down... I'm thinking about something else that's more important"*

Figure 7: Flexible / Inflexible Statement examples

In addition, each session contained a set of 4 questions related to sense of belonging, each aligning to one of Ahn & Davis's (2020) domains of belonging (academics, social, environmental, and personal). Statements were coded as indicative of belonging in this domain, or not indicative of belonging in this domain. The total percentage of belonging for these responses was also graphed, and analyzed for trend and variation over time.

In some respects, this single case element varies from typical expectations for single case research. Due to the nature of the intervention, it was not feasible in the context of this study to establish a baseline by traditional observation prior to the onset of the intervention. As a result, it is not possible to establish a functional relationship between the intervention and outcomes as a result of the analyses here. Similarly, the need to preserve confidentiality and privacy of participants limits the ability to provide inter-observer agreement in the traditional sense. Given these limitations, we describe our methods as a multiple case study, as this study does not fully adhere to single case practices.

With that said, mixed methods approaches can provide an alternative solution to the real need related to validity and integrity which single case research typically addresses through these

steps. In this study, the qualitative and quantitative data provided through the results of the initial survey may help to represent a form of baseline – while insufficient to establish a functional relationship, they are effective in establishing a narrative for each participant, which is the goal of this mixed methods study.

Qualitative Design and Analysis

This study incorporated qualitative data from three main sources: during the pre and post surveys from open-ended survey question items, and the transcripts resulting from each session. Pre and post survey responses are included in the joint displays for each participant.

Transcript data was coded thematically, identifying patterns in flexibility, belonging, and overall narrative of the individual student's experience. Additional attention was given to social validity of the intervention, and participant feedback on the intervention is reported for all students. All results and interpretations were member-checked by each participants to confirm their agreement with assumptions, and provide an opportunity for them to co-construct an account of their lived experience during the intervention. The member checks serve as an alternative to IOA within the context of this mixed methods study, and serve to bolster validity and minimize opportunity for bias. Each participant confirmed the interpretation of results and quotes used for this study.

Survey Design

Surveys were administered both before and after intervention, jointly assessing sense of belonging and psychological flexibility. Surveys were completed online by participants prior to the first in-person session, and following the final in-person session. Sense of belonging was assessed using a modified version of the Psychological Scale of School Membership (PSSM:

Goodenow, 1993). Adjustments have been made to ensure language reflects a higher-education context. Psychological flexibility assessment was adapted from the Acceptance and Action Questionnaire (AAQ-II: Wolgast, 2014), with adjustments made to reflect the focus on academic performance and academic stress. Two additional open-ended questions were also included, to give students an opportunity to describe their sense of belonging and psychological flexibility. A complete list of survey questions is available in Appendix A[**E**].

Analysis

Likert-scale responses provide a rough assessment of psychological flexibility (aggregate score of all AAQ-II responses) and sense of belonging (aggregate score of PSSM responses). The PSSM includes 18 questions, with a per-response scale of 1 (strongly disagree) to 6 (strongly agree), for a maximum potential score of 108. The AAQ-II includes 7 questions, with a per-response scale of 1 (Always True) to 8 (Never True), for a maximum potential score of 56. Scoring of questions for both surveys was adjusted based on the framing of each question (e.g: agreement with positive questions scored positively, with higher point values being more positive). Each response was scored along its corresponding scale, and the total "percentage" of all survey questions for each assessment is reported per respondent in the joint display graph.

Responses for pre- and post-intervention surveys are compared on a per-student basis to give an indication of changes in level of each construct. For the pre-Intervention survey, this serves as an alternative way of understanding the participant's baseline of their existing flexibility and sense of belonging.

Data Integration

The study incorporates Qualitative, quantitative, and multiple case study elements across a semi-experimental intervention design, with the following proximal model of integration:

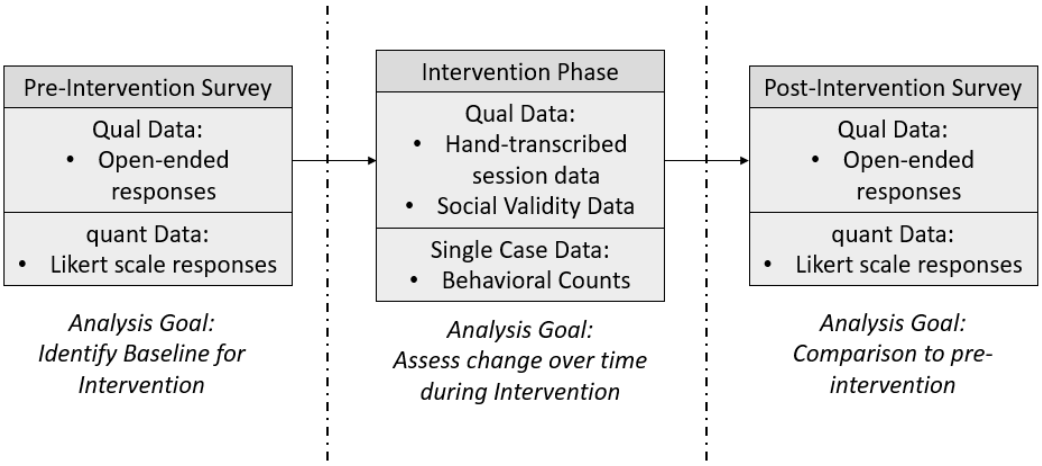


Figure 8: Mixed-methods study model

Data for each individual student participant has been aggregated into a joint display to allow a holistic overview of the impact of the brief ACTraining intervention. For each participant, attention was given to where a line of analysis was in alignment with others, and where it differed, following guidance for mixed methods data integration. Largely, this is achieved by "integration through narrative" (Fetters et al., 2013). The Qualitative data, as collected within sessions, serves to contextualize findings from the pre-and post-intervention surveys. The within-session flexible and inflexible statement data provides the most reliable sense of treatment efficacy, but treatment efficacy should be understood as one component of a broader student narrative, which also, critically, includes the social validity of the intervention, the themes of their lived experience, and the changes that took place for each participant in

belonging and psychological flexibility as aligned with the domains of Ahn & Davis's 2020 model and ACT respectively.

Discussion

Given the centrality of participant narratives in integrating the differing streams of data, the discussion of individual participants is the most critical outcome of this study. A brief summarization of overall findings and implications is also included, after the discussion of each participant's individual narrative.

Participant 1: "Marie"

Marie was a junior, enrolled as a psychology major at the time of the study's commencement. She entered the study with a keen sense of her values already developed. This was demonstrated in her first session, where she described a value of "leaving the world a better place than [she] found it", which had informed her decision to major in psychology. Marie set a goal of becoming more socially connected at the university during her first session, which she reported having largely achieved by session three.

In her initial survey, she reported feeling isolated socially from other students due to her age – she had taken time away from school previously, and was a few years older than her peers. Her perception of her stress at the study's outset appeared to be linked to this distinction as well – she described a sense that "there was more on the line" for her because she had taken that time away from her schooling.

The joint display below provides a holistic overview of Marie's results:

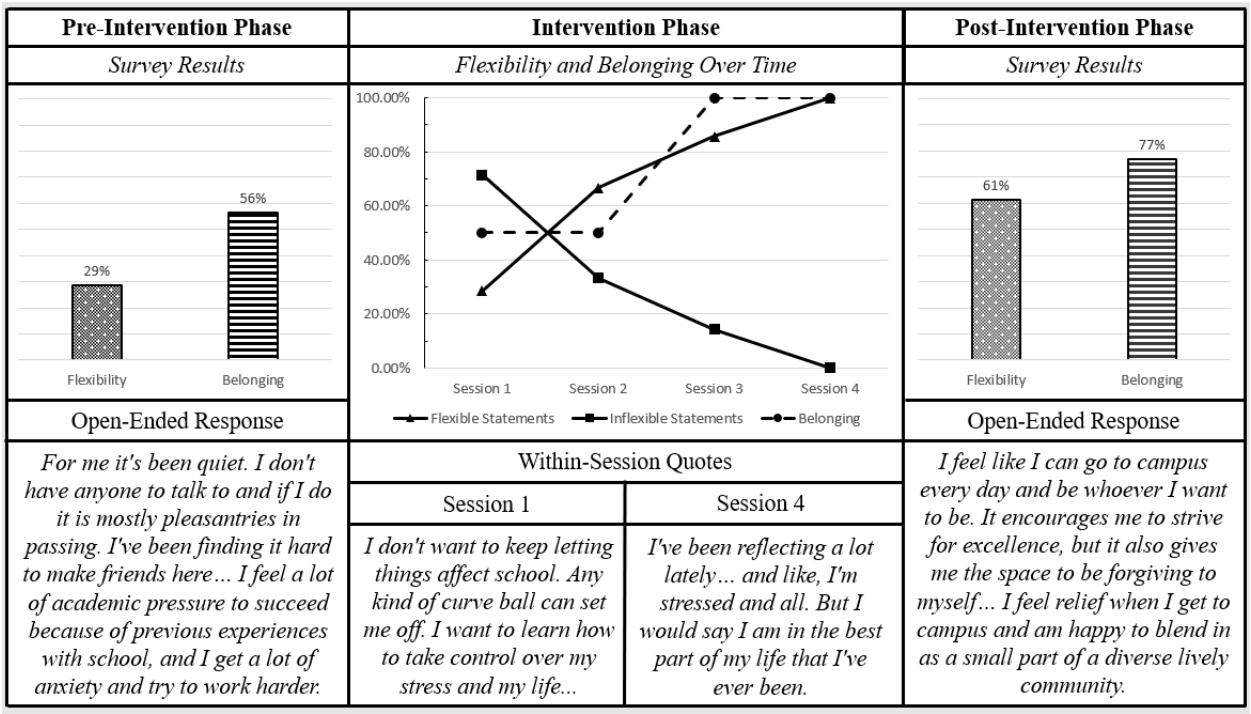


Figure 9: Joint display of data for Participant 1 / "Marie"

Marie's level of flexibility was low in the initial session (29% Flexible), and belonging was roughly at half. This corresponds remarkably well to Marie's informal baseline from the pre-study survey (which showed 29% flexibility and 56% belonging). Marie's graphs show steady improvement in flexibility across the intervention, with steady trends showing increased flexibility and decreased flexibility across the four sessions, toward the final session, in which no inflexible statements were recording. Similarly, belonging increased sharply between session two and session three, with Marie reporting belonging in all four domains consistently in the last two sessions. While the lack of a formal baseline means a functional relationship cannot be established, these results provide a strong indication of clinical success for Marie as a result of this intervention.

The intervention's success for Marie was matched by her own engagement in each activity and enthusiasm for the methods. As a psychology major, she expressed interest in learning more

about the underlying philosophy of ACT, discussing an interest in possibly incorporating its methods into her own counseling repertoire.

Perhaps the best signifier of Marie's progress is a quote from her third session – describing her stress and anxiety around some upcoming exams, Marie explained:

> "I'm stressed right now and having some intrusive thoughts, but I definitely feel like a student right now, which is kind of like double edged sword. Like, oh, definitely going through it - I'm struggling. That also makes me feel connected in a way like that… I'm having, like, an everyday kind of experience. Yeah, yeah, it's like I'm struggling, but it's a shared struggle."

In this example, Marie showcased improved acceptance of her stresses and anxiety. More interestingly, this is indicative of some amount of cascading impact on her belonging. In earlier sessions the same experiences of stress had led her to a sense of isolation. Over the course of the study, perhaps due to growth in flexibility, Marie reframed her experience of stress as shared with others, which seems to have made her feel more a part of her university.

Pre- and Post-Study Survey Results – Belonging and Flexibility

As shown in the above figure, Marie reported relatively low levels of psychological flexibility during her initial survey, scoring a 29% on the modified AAQ-2. This score doubled in the post-study survey, increasing to 61%. This can be contextualized in part by her open-ended responses related to academic stress. Initially, Marie described a sense that her stress "tended to snowball considerably". She stated she felt "a lot of academic pressure to succeed" due to her age and a previous semester from which she had needed to withdraw. In the post-study survey, she

reported that she felt she could "manage [her] academic stress moderately" and could "relieve some stress and refocus on [her] objectives".

At the study's onset, Marie reported an average level of belonging, scoring 56% on the modified PSSM. This increased noticeably by the study's conclusion, where she scored 77%. Initially, Marie shared that she felt "weird" around other students "because they are younger and may not have the same experiences" as her. By the study's conclusion, Marie expressed a belief that she could "go to campus every day and be whoever [she] wanted to be that day". She shared that she felt "relief" on campus, because she was "happy to blend in as a small part of a diverse lively community."

These survey results indicate that Marie experienced significant improvement in both flexibility and belonging throughout the course of the study.

Within-Session Flexibility Data

Marie showed a noticeable growth in flexible statements, decrease in inflexible statements, and change in reported belonging over the 4 sessions of the study.

Marie's initial belonging reports indicated some degree of connectedness to the university itself, and a moderate degree of satisfaction with her "personal space", but a lack of social connectedness and mastery of the student role. Over time, she began to express more confidence, and reported feeling more connected to peers, and by the study's end was making statements indicative of belonging in response to all probing questions.

Marie's inflexible statements at the study's onset were largely indicative of challenges with defusion and present moment awareness. For the latter, she spoke often of fears that the circumstances which had led her to need time away from the university would recur or continue

to impact her academically. For the former, she often expressed a lack of control or automaticity in the connection between her stress and her behavior. As she engaged in the present moment awareness and defusion activities, an immediate change was observed – by the final session, she appeared to have reframed both of these verbal patterns completely.

Within-Session Qualitative Data – Themes and Findings

A number of themes were present in the insights shared by Marie within each session. Of these, the most prevalent were the centrality of her relationships with family, and a tendency to experience negative self-directed thoughts.

Marie spoke often about her connection to her family, particularly her brother, whose experience with autism informed her own values related to helping and caring for others. In early sessions, she identified this as an occasional source of anxiety and stress – she stated she felt she had to "choose between him and school" often, and that balancing those needs made it difficult for her set aside adequate time for self-care.

Over time, she expressed less of a sense that her family relationships were a contributing factor to her stress, and more of a link between her family and her understanding of her values. At times, this connection was explicit – at one point, she even talked about her parents seeming more aware of her values than she was, after she'd spent time caring for her brother:

> "My parents have been, like, I don't know… like "why keep fighting it?
> You're going to end up doing something like this one day."

At times, her interaction with family appeared to offer insights into her sense of belonging at the university, as well. Marie shared one interaction, during March Madness, where her family had been gently making fun of her for cheering on the university team when she does

not typically get involved in sports. Marie described a sense of "school spirit" after this interaction, sharing that she felt "like a [university mascot]" in a way she hadn't previously.

Initially, Marie shared with some frequency a tendency to experience negative self-directed thoughts. She shared a lot of self-dialogue, including questions of whether she was falling far behind in her classes, feeling like a poor student, or a poor sibling at times. Marie described an explicit link between this negative self-directed thought and outward behavior. She provided an example where, on days she felt she had already fallen behind, she would often, by her judgment, overeat:

> "Like, 'OK, well, I've had a bad day so I don't have to eat healthy today,
> and other stuff like that. It can get, like, self-destructive."

Marie often described these events as seemingly out of her control – she said she "felt like she had to punish herself", and that "if things were bad, they were going to be really bad".

While Marie continued to report these negative self-directed thoughts and lower feelings throughout the study, this sense that they would by necessity manifest in self-destructive behaviors or would automatically impact her academics began to shift. At one point, she described stress about a writing assignment. Although she said she felt she was "a bad writer" and that this led to thoughts that she was "not dedicated enough" or working hard enough, she immediately added the addendum that she "knows that's not true, of course", and shared that she'd been able to continue making progress in spite of those thoughts. In her final session, Marie observed that, while her stress had not miraculously vanished, she had not let it "paralyze her", and expressed pride that she had been able to keep up with her work in spite of it.

Overall, Marie's language became more flexibly framed throughout the study. In initial sessions, her descriptions of school and of her family relationships seemed to be either strongly based in past events (e.g: those that had led to her need to take time away) or grounded to a sense of automatic behavior based in negative feelings. Over time, Marie began to identify these feelings as she encountered them, which seemed to lead to an ability to work through them. In turn, her description of her sense of belonging shifted. She went from a feeling of having no social life to having a sense of connection to the university – from a sense that her stress and anxiety isolated her from others to a sense that it linked her to fellow students. This pattern is consistent with that shown in her survey and within-session data, and indicative of progress throughout the period of the study.

Social Validity Insights

Throughout the study, Marie frequently shared a sense that some of what she was learning was proving useful. In her final session she expressed a sense that she was "slowly but surely improving as a student", and that although she was still experiencing stress, she was "in the best part of [her] life she [had] ever been". Notably, Marie requested to continue engaging with the intervention's "Stress Management" programming at the conclusion of the study.

Overall, Marie appears to represent a more or less ideal scenario for the application of ACTraining within the context of Student Affairs to support students with disabilities. In cases such as Marie's, where the primary impact for the student is mental health, ACTraining appears to be an appropriate model for increasing flexibility. Moreover, there is some indication that when effective, ACTraining may have some lateral benefits on sense of belonging. In Marie's case, each line of data analysis was in alignment, strongly supporting a cohesive narrative of intervention success, and positive response.

Participant 2: "Quinn"

Quinn was a freshman, majoring in the arts at the time of the study. They describe themselves as non-binary trans and autistic, and were involved in a small number of resource groups at the university seeking to serve those populations. Quinn often expressed a sense that communication was particularly difficult for them, which they connected to their autism diagnosis. They also shared that many of the activities comprising the curriculum of this study, particularly the mindfulness activities, were challenging for them due to their relationship to their body as a trans person and their sensory experience as an autistic person. They set a goal for themselves of trying meet new people, which they achieved between session two and session three.

The joint display below provides a holistic overview of Quinn's results:

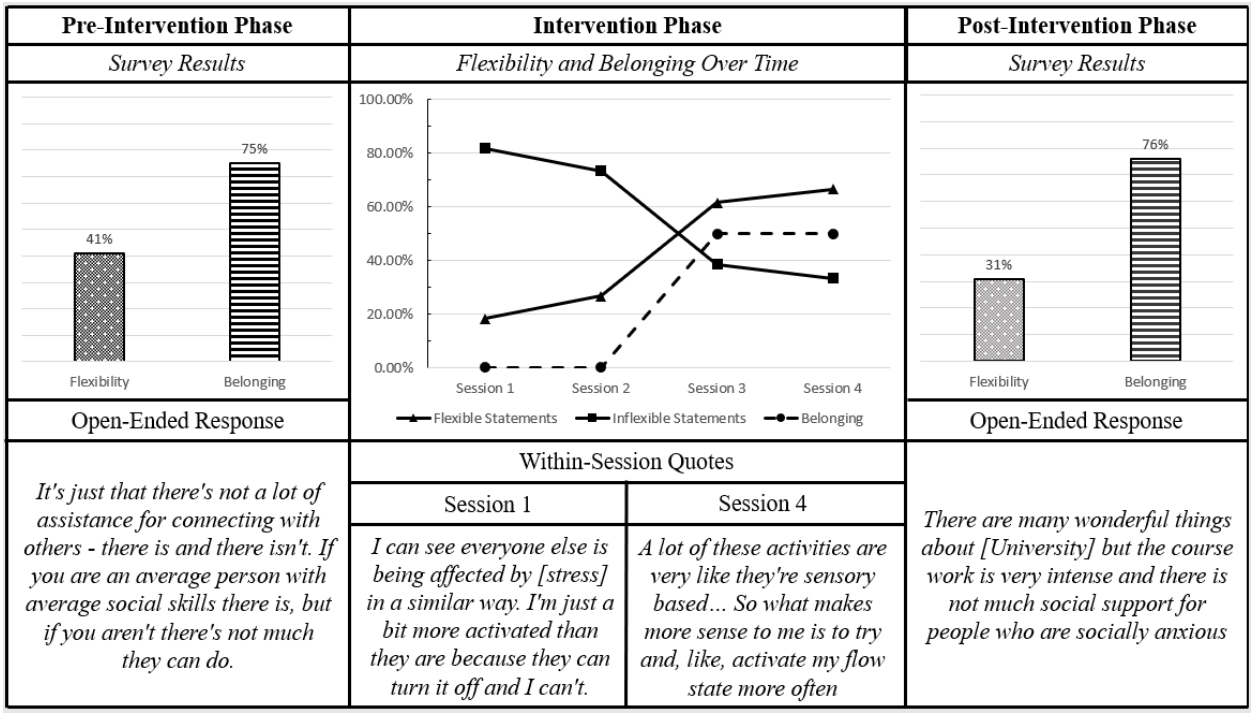


Figure 10: Joint display of data for Participant 2 / "Quinn"

Quinn's level of flexibility was low in the initial session (18% Flexible), and they reported belonging in none of the four domains. This is somewhat in contrast to their baseline survey, in which they reported an overall high level of belonging (75%). Quinn's graphs show steady improvement in flexibility across the intervention, with a sharp increase between session two and three, toward the final session, in which about two thirds of Quinn's statements were coded as flexible. Similarly, belonging increased sharply between session two and session three, which may in part be explained by their success in meeting new people within their major. Visual analysis of this growth indicates preliminary clinical success for Quinn from the intervention – however, their survey results are in contrast to this conclusion.

The intervention appeared to have more mixed results for Quinn. They described some discomfort with the more meditative aspects, but did share that they found them helpful when their stresses were "already in a very escalated situation", to prevent things from becoming worse. This appeared to offer a small bit of comfort, but they were interested in exploring alternatives to mindfulness that would be more catered to their unique lived experience.

One specific strategy they identified, with which they reported some success, is pursuing a "flow state" to moderate their stress as a substitute for meditation or mindfulness activity. They described crochet as a preferred activity, and found that engaging in this activity when stress began to build could at times prevent it from getting too elevated. Although Quinn's survey results indicated a decrease in flexibility, their descriptions of their lived experience during sessions became more flexible over time, particularly as they described their relationships with peers and faculty members.

Pre- and Post Survey Results – Belonging and Flexibility

As shown in the figure above, Quinn reported moderate levels of psychological flexibility during their initial survey, scoring a 41% on the modified AAQ-2. This score decreased in the post-study survey, 31%. A few factors may contribute to this decrease – the questions in the modified AAQ-2 ask students to report on stress. Quinn completed their post-study survey during the week midterm exams were scheduled, which may have contributed to higher levels of stress for them. It is also possible that the frustration they reported with the mindfulness activities may have contributed in part to their responses.

The surveys indicate no change in Quinn's belonging, which was reported at 75% on the PSSM in the initial survey and 76% in the post-study survey. Overall, Quinn's PSSM score was high from the outset, perhaps indicating that their engagement with campus resources connected to their identities had led to a sense of connectedness to the community which predated the study. It is worth noting that, during the study, Quinn reported a number of social interactions that they were hopeful could lead to friendships, when they had initially described their social life as "non-existent". Additionally, their descriptions of interactions with faculty became more flexible and tolerant as the study progressed.

Overall, the surveys seem to indicate that the intervention was less beneficial for Quinn than for Marie. A thorough review of the contextual data (particularly the qualitative data) can help to indicate the nature of this response.

Within-Session Flexibility Data

The coding of within-session data indicates a moderate growth for Quinn in both the proportion of flexible to inflexible statements and their reported sense of belonging.

In their initial sessions, Quinn reported low levels of belonging among all four questions. By their third session, they had begun to show some changes, indicating they had begun to explore forming social connections – at one point getting the phone number for a classmate after a museum visit – and to identify their strengths as a student, particularly in the arts.

In early sessions, Quinn's inflexible statements typically stemmed from challenges with defusion (e.g: "I don't think [my professor] has taught someone who gets as stressed as I do"), present moment awareness (e.g: "last semester I had no idea what was coming, but this time I do… so I have the ability to be stressed about it now"), and occasional difficulty with acceptance of difficult emotions.

Over time, Quinn began to show growth, particularly with fused thinking. They seemed to be making a conscious effort to understand their professors thinking (e.g: after a frustrating interaction with an art professor "at least he gave me more time to work on [the assignment]… I guess I understand what he did and why he did it"). This seemed to have a corresponding impact on acceptance of frustrating professor interactions. After one frustrating interaction with a math professor, Quinn observed:

"If I'm going to have a teacher who's like this, I'm glad it's my math teacher because I can do without the teacher in most math classes. Math is just a series of instructions, I follow the instructions I get the answer."

Growth in acceptance of their more frustrating interactions, connected to what appeared to be a conscious effort to approach faculty interactions more flexibly, explains the majority of growth in Quinn's flexibility. This may also help to contextualize the decrease in their flexibility score from their survey – their stress did not decrease during the study, and may have been more

elevated at the time the survey was completed due to the timing within the semester. However, there is some evidence that Quinn's ability to be present with that stress increased over the study.

Within-Session Qualitative Data – Themes and Findings

Overall, the major themes emerging from Quinn's time within session were their relationships with faculty and their experience with the mindfulness and present moment awareness components of the study itself.

As discussed briefly above, Quinn often spoke of interactions with professors as major sources of stress. In early sessions, they described their professors in somewhat rigid terms, expressing a sense that the professors were intentionally or by their nature causing frustration for them – even saying of one professor that "he has set you up to fail and he knows it."

Over time, beginning in the second session, Quinn began trying to push toward more flexible interpretations of faculty behavior. In that session, they initially expressed frustration with a professor's unexpected cancelling of a class, but eventually added: "I get that they… life happens. But you need, like, a co-teacher or something". By the third session, they were consistently seeking addendums for faculty frustrations, which often led to their recognition that the faculty had been supportive (e.g: extending deadlines) to them, specifically. At one point, they identified a specific professor as "one of the most disability-friendly on campus". In general, while the presence of frustrating faculty interaction never seemed to go away for them entirely, they seemed able to adopt a more accepting and flexible stance – at one point, even observing "It's out of my hands. Yeah, I'm just going to have to deal with it."

Another major theme in discussion during session was Quinn's relationship with the present-moment awareness components of the study, particularly those focused on mindfulness. In its

simplest form, they expressed their discomfort as connected to their trans identity: “because I’m trans, I tend to disassociate from my body because I don’t like it.” At other times, they linked their frustration with present moment awareness to autism, and their sensory experience:

“I feel like there's complexity there because, like, being in the present moment is not at all something I can do… I have so many sensory issues, I have to, like, I cannot function if I am in the present moment all the time. Yeah, like, I just, I can't. So, I have all these things that incentivize me to, like, not be grounded or present, which makes doing that very difficult.”

Despite this, Quinn found that some of the meditative exercises that were not grounded in the body or the environment (e.g: “Leaves on the Stream”) were beneficial for them when their stress became particularly elevated. This led them to want to explore alternative means of achieving a meditative or “flow” state, particularly through preferred activities such as crochet. Ultimately, the context shared by Quinn is indicative that a rigid curriculum of ACTraining may leave gaps in its applicability. Service providers in Student Affairs seeking to provide ACT as a resource to students should be ready to pivot based on the unique context of students with overlapping needs and, ideally, have access to practitioners with experience serving unique identity groups.

Social Validity Insights

As designed and standardized for the purposes of this study, ACTraining had marginally less utility for Quinn than for other participants. Many of the activities in the intervention were centered around mindfulness activity, either asking participants to engage their senses in the environment (e.g.: five things you can see, hear, etc.) or in the body. Quinn reported that

"because [they are] trans, [they] tend to dissociate from [their] body because [they] don't like it", and that environmental meditations could be overwhelming due to sensory issues.

On a few occasions, Quinn and the interventionist discussed alternative strategies, e.g: crocheting, which could achieve what Quinn called a "flow state", similar to meditation. Quinn described this as helpful, and meditations such as "leaves on the stream" they indicated were useful when they were "already in a very escalated situation" to calm down when stress became overwhelming. It is possible that a clinical ACT practitioner, particularly one adept at working with trans-identified adults, may have been a more effective match for Quinn's needs.

It is notable that, despite these reservations, Quinn requested to continue with the "Stress Management" programming at the study's conclusion, specifically hoping to discuss more personalized approaches once the more structured sessions comprising the study had concluded.

This somewhat paradoxical outcome may serve to contextualize the conflict between Quinn's within-session data, which shows steady, if slower, improvement, and their survey data, which indicates a decline in flexibility. Ultimately, Quinn's perception that the intervention, as narrowly implemented for the purposes of research, was less effective for them, is well founded. However, in identifying and learning strategies, Quinn was able (with the support of the interventionist) to identify strategies which are compatible with ACT but not directly included within the intervention, which provided meaningful support to them.

Overall, Quinn serves as a reminder that no solution is universal. The importance of context is paramount, and for students with specific backgrounds adjustments or alternative resources may be more appropriate. Implementation of ACTraining must be broader than the options included within this intervention to include a wide range of students with disabilities, and the availability

of a diverse team of practitioners with backgrounds providing insight onto that wide range of students is paramount.

Participant 3: "Liyana"

Liyana was a sophomore, enrolled in a double major of Science and Psychology at the time of the study. Liyana is Pakistani, and Muslim and already had a large friend group of students of similar identity prior to the onset of the study. Liyana is also a person with a chronic condition, which has in the past led to specific, immovable sources of stress, discomfort, and academic impact, which she spoke about throughout the study. Liyana spoke often of the value of giving back to her community, and initially set a goal for herself of getting a better grade in her Chemistry course. Over the course of the study, Liyana identified that her Chemistry course (along with other required science courses) was not directly supporting her in living on her values, and began exploring alternative majors which would not require such courses.

The joint display below provides a holistic overview of Liyana's results:

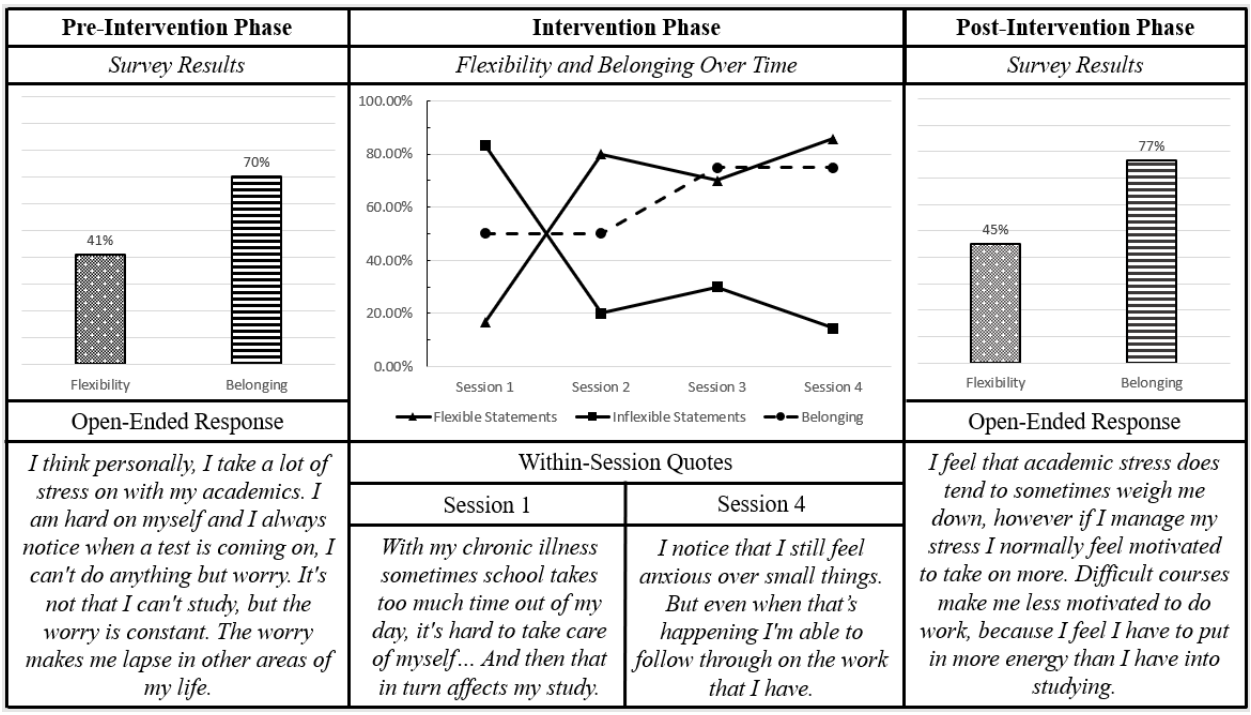


Figure 11: Joint display of data for Participant 3 / "Liyana"

Liyana's level of flexibility was low in the initial session (17% Flexible), and she reported belonging in two of the four domains. This is somewhat in contrast to their baseline survey, in which they reported an overall high level of belonging (75%), and had a flexibility score of 41%. Liyana's graphs showed a sharp increase between session one and two, with a slight decrease between within session three – this decrease may in part be explained by the onset of Ramadan, which Liyana observed by fasting. In her final session, Liyana's recorded statements were 86% flexible. Liyana began reporting higher levels of belonging by session 3, at which time she had begun exploring a change in major and began to feel more confident in herself as a student. Visual analysis of this growth indicates preliminary clinical success for Liyana from the intervention – however, their survey results are inconclusive, with only marginal growth.

Liyana showed slight improvement in each category throughout the study, and made noticeable strides within sessions. Context is a key factor in interpreting the level of success for Liyana in engaging with the intervention – while some aspects of Liyana's stress, particularly those linked to flares of symptoms from her chronic condition, were unlikely to change as a result of this intervention, Liyana identified a number of useful strategies. Perhaps most interestingly, Liyana made the decision to adjust her major plan, removing one of her double majors and looking into Interdisciplinary studies – in discussing this decision, she explicitly cited the new approach as being better in line with her values.

Pre- and Post Survey Results – Belonging and Flexibility

As shown in the above figure, Liyana reported moderate levels of psychological flexibility during her initial survey, scoring a 41% on the modified AAQ-2. This score increased slightly in the post-study survey, increasing to 45%. This can be contextualized in part by her description of the courses she was taking. Liyana described the Chemistry courses associated with her Science major on multiple occasions as a leading source of stress for her. This source of stress was exacerbated by her condition, which often led to absences, and a sense of falling further behind in this course. Although those sources of stress did not change during this study, Liyana appeared hopeful that in future semesters, her decision to focus in on psychology, linked to her value of helping and serving others within her community, would reduce this source of stress.

At the study's onset, Liyana reported a fairly high level of belonging, scoring 70% on the modified PSSM. This increased slightly by the study's conclusion, where she scored 77%. This is perhaps best explained by Liyana's attitude toward the university itself. Initially, Liyana reported some trepidation about attending the university, sharing that "when [she] visited the campus, [she] didn't like it". Over time, Liyana seemed to be beginning to view the university

through the lens of her positive experiences with her friend group, and it is likely that her increase in belonging is linked largely to a warmer view of the university as a whole.

These survey results indicate that Liyana experienced slight improvement in both flexibility and belonging throughout the course of the study.

Within-Session Flexibility Data

Liyana showed a noticeable growth in flexible statements, decrease in inflexible statements, and change in reported belonging over the four sessions of the study.

Liyana's initial belonging reports indicated a strong social connectedness within the university context (due in part to her membership in the Muslim and Pakistani student organizations), and a moderate degree of satisfaction with her life in general, but a low sense of confidence in herself as a student and sense of disconnection from the university. Over time, she began to express more fondness for the university, raising her reported belonging in this domain. At the study's conclusion, she still seemed concerned about her academic performance, but was optimistic this would change going forward due to her major change in future semesters.

Liyana's inflexible statements at the study's onset were largely indicative of challenges with acceptance of her academic stress and, to a lesser degree, defusion – particularly defusion from rules related to academic engagement. Liyana talked a lot about feeling elevated levels of stress when material felt unfamiliar or challenging, particularly in Chemistry: "when things start getting hard, that's when I start freaking out." Liyana expanded on this to describe a phenomenon where her more intensive experiences of stress would lead her to not do the work associated with the stress, or not attend classes where she felt behind.

Over time, Liyana began to approach these concerns more flexibly. During Ramadan, as an example, she described working with campus resources and her professor to catch up when the combination of her condition and the added stress of fasting led her to fall further behind in chemistry. Overall, Liyana showed improvement in acceptance and flexibility with her condition, leading to significant growth in committed action to support her academic needs.

Within-Session Qualitative Data – Themes and Findings

The primary theme for Liyana throughout her engagement in the study was the interaction between her faith, her academics, and her condition. She emphasized the importance of her morning routine – praying, eating, sleeping at consistent times, which become easily disrupted by symptoms or by the need to complete school work.

Liyana described a cycle wherein needing to miss days due to a flareup of her chronic symptoms would lead to absences (e.g: “this might sound really bad, but I just don’t go to class the days that I don’t feel well”) – or, on a smaller scale, that a delayed start to her morning would throw off her day, and that this would lead to absences:

> “I normally feel pain, like in the morning when I wake up… It happens when it happens, and when it does I feel like I have to, like, be like, it's OK… I can make up my prayer later… for Chemistry, I'll just have my friend send me the notes or something.”

Initially, Liyana described this cycle as largely immutable. Indeed, the timing of her symptoms is certainly outside of her control, and imposes significant barriers to her academic engagement. Over the study, however, Liyana identified strategies for making space for the unpredictable occurrence of her symptoms. She described approaching her schedule more flexibly, including

making time for social interactions that were meaningful to her. Academically, she began studying with peers more regularly, which she found helpful:

> "I was working with, like, a group of friends because we're all, like, struggling. We just kind of help each other. And by the end, I think I was able to do, like, two problems on my own. So, I think that's a good sign."

Additionally, Liyana began to identify the consistency of Chemistry, and the sciences in general, as a source of her academic stress. Her decision to change majors began in early sessions of the study, discussed with her advisor, advisors for other majors, and the interventionist throughout.

Overall, Liyana's time during the study appeared to connect her with meaningful committed actions. As she observed, the specific activities in the study were not always ones she continued to use (though she reported finding the meditations helpful), but the opportunity to consider her values more flexibly appeared to lead to meaningful results for her.

Social Validity Insights

One indicator of the potential utility of this intervention for Liyana was the unique level of committed action she undertook over the course of the study. Initial conversations around her values led to a reassessment of her major. Liyana reported that some of the courses required for her double major (e.g: 'hard' sciences such as Chemistry) were her greatest source of academic stress, and that most did not seem relevant to her values. By the study's end, Liyana had switched to an Interdisciplinary Studies major which was better aligned with her goals, and insulated her from some sources of unneeded stress. On a smaller scale, Liyana frequently identified specific activities (e.g: engaging in tutoring, calling her family more regularly, going

to office hours), which would allow her to meet her academic expectations on days when her symptoms were elevated, and would help to balance her stress.

Liyana identified the intervention as useful for her, particularly the meditations, which she found helpful to "center" her. Overall, she described the values matrix as the most useful portion of the programming for her, and indicated that refocusing on whether her goals were in line with her values, or if she were "doing them to please other people". At the study's conclusion, Liyana also requested to continue with the "Stress Management" programming.

Integrating Liyana's data requires balancing the inconclusive survey results with within-session data indicative of clinical success. The key role of committed action in her narrative may provide an explanation of this – while the change in her major is likely to have long term impact, and appeared to provide some immediate relief to her sense of academic confidence, she chose not to withdraw from chemistry, and it remained as a source of stress and tension throughout her semester. Because Liyana reported such a strong sense of belonging initially, it is difficult to assess change in this area – however, it is worth noting in her narrative that her increased comfort with the sciences as a source of stress led to additional time spent with peers, both socially and in shared study time, which may encourage either maintenance or development of social belonging for her over time.

Overall, Liyana is another example of success in this programming, and provides a helpful reminder that practitioner knowledge of campus resources (e.g: tutoring, advising, policy, etc.) may help shape the efficacy of ACTraining in the context of Student Affairs, as these factors can serve to create opportunities for committed action for students.

Participant 4: "Amber"

Amber was a freshman, majoring in the arts at the time of the study. She apparently felt a strong connection to the university (in her words, an obsession) prior to the study's onset. Amber had a strong sense of her values, linked to her interest in working in game development. She described a long-term goal of creating games which would give representation to disability – particularly to autistic adults, which she described as underrepresented within existing game storytelling. Amber expressed a high degree of academic stress prior to the study's onset, which appeared to diminish rapidly as the study progressed.

The joint display below provides a holistic overview of Amber's results:

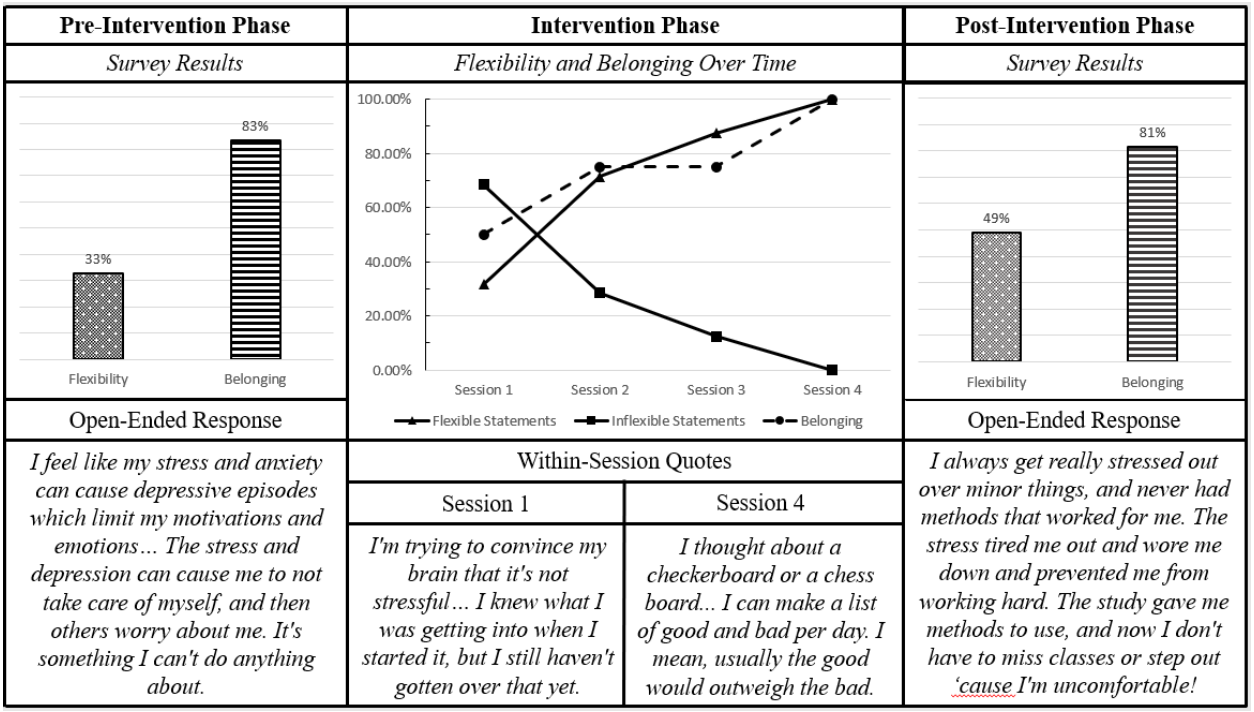


Figure 12: Joint display of data for Participant 4 / "Amber"

Amber's level of flexibility was somewhat low in the initial session (32% Flexible), and she reported belonging in two out of the four domains. This is somewhat in alignment to her baseline survey, in which she reported an overall high level of belonging (83%), but a comparably low

level of flexibility (33%). Amber's graphs show steady improvement in flexibility across the intervention, with a steady increase within each session toward the final session, in which all recorded statements were coded as flexible. Similarly, belonging increased over the course of the intervention, from 50% at session one to 100% on session four. Visual analysis of this growth indicates clinical success for Amber from the intervention. Although the surveys do not indicate significant change in belonging, Amber's initially high score left little room for improvement in this area as a result of the intervention.

Amber made clear progress in flexibility throughout the study. Belonging is less conclusive – in part, this is due to her extremely strong sense of connection to the university before the study began. Amber indicated a clear sense of value from the intervention, and overall seems to have found it useful in improving her academic stress and confidence as a student.

Pre- and Post Survey Results – Belonging and Flexibility

As shown in figure 6, Amber reported somewhat low levels of psychological flexibility during her initial survey, scoring a 33% on the modified AAQ-2. This score increased significantly in the post-study survey, increasing to 49%. This is consistent with her open-ended responses to the survey questions relevant to stress. Initially, Amber described a sense that her stresses were "something [she couldn't] do anything about", whereas by the study's conclusion she felt she had access to methods which were effective in regulating her stress. Amber explicitly links this to her academic engagement, particularly noting that being able to master her stress more consistently improved her attendance and in-class engagement.

At the study's onset, Amber reported a very high level of belonging, scoring 83% on the modified PSSM. This decreased slightly in the post-study survey, where she scored 81%. A

small change like this may be inconclusive. Amber was consistent, throughout the study, in describing the university in glowing terms, and as a space where she felt deeply welcomed and connected. Of note here is a comment made in her final session – Amber challenged herself to find a negative thing to say about the university, and shared her concern that it "didn't have a specifically defined game design track" that she could major in. One might argue that this is a more flexible view of the university, and that her self-described obsession had previously obscured this reality from her. If she is able to identify this gap without negative impact to her belonging, this may be a net gain for her in the long run.

Overall, these survey results indicate that the intervention was successful in supporting Amber's psychological flexibility.

Within-Session Flexibility Data

Amber showed a noticeable growth in flexible statements, decrease in inflexible statements, and change in reported belonging over the four sessions of the study.

Amber's initial belonging reports indicated a very strong sense of satisfaction with the university and her life in general, but a low sense of confidence in herself as a student and sense of social isolation. Over time, she began to express more confidence in herself as a student, and began developing friendships within her major, corresponding to a noticeable growth in her self-reported belonging over the course of the study.

Amber's inflexible statements at the study's onset were largely indicative of challenges with present moment awareness and, to a lesser extent, defusion. Amber's concerns with present moment awareness largely manifested as worry about future events (e.g: upcoming tests and projects) at the expense of engagement in necessary present-moment activities (e.g: "when I get

stressed, my brain forgets all these things that were not written down. And sometimes I'll forget to write it down because I'm so stressed"). This led to a sense of fused thinking about her stress as immutable – that her stress would automatically lead to an inability to engage in necessary tasks, which would itself create stress which cyclically led to more disengaged behavior.

Perhaps as a result of the availability of the strategies and activities shared in the study, perhaps as a result of exposure to discussion of flexibility, Amber began to describe her stress more flexibly over time, repeatedly focusing on strategies (e.g: breaking her drawing work into smaller bursts of activity) to reduce stress, rather than simply stating it as an inevitable outcome that her stress would negatively affect her work.

Within-Session Qualitative Data – Themes and Findings

Amber spoke very rapidly, and was prone to telling stories about her week that led to numerous themes and patterns, but in general, this application and development of strategies proved a major relevant theme of Amber's sessions.

In early sessions, Amber identified her sleep cycle as an area for improvement. She reported going to bed very late, which in turn led to waking up late and feeling stressed. Amber set a goal of reducing her time with screens before bed, and replacing it with other activities, such as reading. Amber reported success with this plan in the next session (e.g: "I've been sleeping better because I just started reading at night. I stopped watching TV).

During the study, Amber strongly connected with the checkerboard activity, and expanded on it with her own addition of a "filing cabinet":

> "I had two drawers; one was the good stuff, and one was the bad stuff.
>
> And if I thought that my day was going kind of bad, I think about all the

> good stuff that happened that day and that's pretty cool to find something good, even though my day was literally filled with lots of stuff that was like, busy, lots of work."

Amber reported using this strategy regularly, and found it helpful in setting aside stress for later when it was important to engage in activities in the long run. Amber also reported that the word repetition activity ("Coke Coke Coke") was helpful when she became particularly stressed at home, and that she would alternate between repeating stressful thoughts or saying them aloud in a silly voice to defuse the stress of the situation.

In general, Amber was an active and engaged participant in the programming which comprised the study, and expressed a lot of enthusiasm for the methods.

Social Validity Insights

Amber placed a high value on her participation in the program, best exemplified in her response on the open-ended question in the post-study survey which claimed participation in the study had given her "methods to use" to remain in class when her stress became more elevated. Again, Amber requested to continue with programming at the study's conclusion.

Overall, data for Amber is fairly consistent in regards to flexibility – with both survey data and within-session data indicative of success for her from the intervention. Belonging is less aligned, and less conclusive – Amber's own description of her relationship with her university may address this best. In her own words, Amber described herself as "obsessed" with her university, an obsession which likely influenced her survey responses.

Overall, Amber's success with the programming demonstrates that it can, in some cases, be effective with students identifying as neurodivergent. In contrasting her experience with Quinn's,

a key takeaway for practice should be both the flexibility of programming to comprise a wider range of methods for engaging in present-moment awareness, and addressing staffing of interventionists to include practitioners with experiencing serving students at the intersection of multiple layers of clinical need.

Addressing Interpretation Bias

A small-scale case study presents considerable opportunity for bias in its interpretation. Where possible, steps have been taken to mitigate this bias. By member-checking the interpretation and conclusions drawn from analysis of participant data with each participant, the researcher was able to minimize misinterpretation of qualitative data. For this reason, the results of this study should be understood through the lens of the viability of these methods for this purpose, not as a statement of absolute efficacy.

While there has been little to no direct application of ACT research to sense of belonging prior to this study, the scoring of flexible vs. inflexible statements is consistent with practice in ACT research. As a mixed-methods study, the presentation of qualitative data in discussion of flexibility is also meant to provide the reader with their own opportunity to interpret and assess the outcomes of this intervention for each participant. The limitations of this study, and efforts taken to reduce their impact, are discussed below.

While each participant had a unique context within the study, and some variation in outcomes, there are key patterns in the student experience. From the standpoint of social validity, each participant indicated a desire to continue with the intervention at the conclusion of the study. Further patterns, trends, and their implications, are discussed below.

Limitations

The findings of this study should be understood through the lens of its limitations. The most critical limitation of this study is the inability to establish a baseline prior to the onset of the intervention, which prevents the establishment of a functional relationship. While the outcome of this study can be viewed as a narrative, providing an overview of the use of ACTraining to support this population, future researchers should prioritize empirical methods which permit the establishment of a functional relationship – for example, in cases where ambient observation of participants is possible, researchers may be able to establish a baseline through observation prior to the onset of the intervention.

Within the above narratives, consideration should be also given to a few additional limitations. First, the curriculum developed for this study was standardized for research purposes – this led to a mismatch in some cases between the needs of students and the curriculum (e.g: with Quinn), which future studies should consider in either their recruitment or in the design of their intervention. Future research in this area should either broaden the intervention's methods, or add additional exclusion criteria, to minimize this risk.

Overall, the goal of this study was to demonstrate the value of this methodology to both the population and the support of sense of nelonging. It is the perspective of the author that the narrative shown in the above findings make this case – however, future research should seek to prioritize a more rigorous approach to more thoroughly understand the implications of these methods for this population and goal.

Implications

Although it is not advisable to draw substantively generalizable conclusions from multiple-case research, there are some meaningful implications from the individual student narratives presented above.

Perhaps the most promising finding relates to social validity: this study does offer a strong indication of social validity for ACTraining to support college students with disabilities. Three out of four participants described the activities comprising the intervention as broadly useful, and all four described at least some circumstances in which they would gain benefit from what they had learned. Most critically, all four participants requested to continue working within the "Stress Management" programming when the initial four sessions had ended.

Social Validity here can be seen through the express self-report of each student, through the desire of each student to continue with the programming, and in some cases through distinct progress. However, indicators of progress varied for each student.

For Marie, the study seemed broadly successful. Exposure to ACT methods helped her be more open to social experiences and to persevere through momentary academic stress to continue on pace with her studies. Marie's results were the most dramatic, but each student made some form of progress. Liyana took clear, large-scale steps to adjust the trajectory of her college journey in a way that would be better aligned with her values while also reducing her stress and financial burdens. Amber identified a number of small, usable strategies which helped make her stresses feel more manageable, and promoted more consistent academic performance. Although Quinn identified some challenges for themselves in accessing some elements of the study, particularly those related to mindfulness, they appeared to have value in times of significant crisis, and Quinn appeared to grow more flexible in their perceptions of professors throughout the study.

It is more difficult to posit conclusively the impact this study had for students' sense of belonging. Each student showed marginal change or growth in this area as assessed through the within-session questions, but the survey results were inconclusive for many students. As a practical matter, this appears to be influenced by the relatively high level of belonging reported by each student even at the study's beginning. Of the four students, only Marie reported significantly low levels of belonging – and, notably, she reported the greatest improvement at the study's conclusion. Other students had clear pathways to belonging already established – friend groups, pre-existing views about the university, campus resources, etc. – which led to a high baseline belonging that it would be unreasonable to expect to see improve dramatically. In each case, students showed growth in some dimension of belonging identified in our model – student identity, social connections, etc. Future studies should seek to recruit from a pool of students previously surveyed to have a low baseline level of belonging to determine whether ACT as an intervention is able to consistently impact sense of belonging, and if so to what degree.

Although the clinical implications of these narratives may have the most significant utility to practitioners, researchers may note the value of mixed methods to the study of ACT as a key takeaway of this study. Given ACT's grounding in language, qualitative data helps to contextualize traditional ACT measures such as survey data, and traditional ACTraining outcomes such as statement flexibility and engagement with committed action. Declining to include such a rich source of data denies researchers the opportunity to contextualize the experience of their participants. In the case of this study, where narrative was central to understanding the student experience, mixed methods was a necessity. Future researchers might consider it a luxury – where resources permit the collection and analysis of qualitative data, and its integration with other measures, the overall resulting findings will inevitably be strengthened.

Conclusions

The four cases comprising this study provide a compelling overview of the value of ACTraining to support students with disabilities. Visual analysis of each participant's within-session data was indicative of clinical success – and while survey data for some participants was less conclusive, the overall narrative of each participant's experience shows a unique pathway to value for engagement with ACTraining.

Some students, like Marie, may find a holistic, considerable benefit in more flexibly approaching their relationship with their education – which may have cascading impact on belonging. Others, like Quinn, may find solutions for their most urgent moments of stress at minimum, and a framework for developing their own unique strategies at maximum. Students like Liyana may identify a surprisingly simple solution to their concerns about academics when they are able to approach problem solving more flexibly. Students like Amber may realize they were more capable of managing their stresses and anxieties all along than they had ever realized, by becoming more able to view themselves in context.

From an implementation standpoint, ACTraining is resource-light, demanding only a few meetings a semester from a small number of trained staff. Training in ACTraining is widely available, inexpensive, and requires low investment of time in comparison to more intensive clinical approaches. The students with disabilities included in this study appeared to find it a positive experience, and each in their own way garnered some benefit from engaging with the "Stress Management" programming – this may indicate a wide range of opportunities to embed ACT on a college campus, including counseling services, disability resource offices, identity centers, and general student health/wellness campaigns. Where these opportunities are identified, there is some reason to expect that students who engage with them may find new opportunities to

experience sense of belonging at their university, in addition to becoming more resilient to the impact of their academic stresses.

Future research should seek to shine a brighter light on the nature of belonging as a process, and the potential of tools like ACT to empower students to improve their own belonging. Psychological flexibility appears promising in its connection to academic stress, and resources derived from ACT may be able to find a home in the halls of Student Affairs, should future research identify a path to best practice.

Chapter 5: Discussion of Overall Conclusions

On the whole, this dissertation serves as a hopeful statement of the viability of behaviorist thought, methods, and language in serving the study of sense of belonging in education – and the importance of understanding belonging to behaviorists.

At the outset of this dissertation, I set out to answer the following questions:

1. How would a behaviorist describe and understand sense of belonging?
    a. What value does this construct hold to behavioral research?
2. How is belonging constructed and shaped at the level of individual behavior?
    a. Are there behaviors currently known within belonging research to be supportive?
3. Can direct behavioral intervention among college students with disabilities lead to an increase in their sense of belonging?
    a. Does Acceptance and Commitment Training support the increase of psychological flexibility and belonging for students with disabilities?

To these questions, I would propose the following, tentative answers:

1. A behaviorist might describe a student's statement of their sense of belonging as a tact of their history of reinforcement in their educational context.
    a. Understanding a student's sense of belonging can help interventionists understand confounding factors which might influence the effectiveness of interventions – belongingness can be understood as a motivating operation, influencing the effectiveness of reinforcement available in the school environment

2. Belonging is co-constructed through reciprocal interactions between students, professors, and institutional staff. These interactions are reliant on the actions of both parties, and in part shaped and guided by the contextual factors of institutional policy.
    a. A number of behaviors were identified in the literature as generally supportive of belonging. Again, these are behaviors which often require a reciprocal interaction between multiple actors at the institution. Some of the most common examples include involvement with cultural identity centers. For this to function as a support for belonging for an individual student, a number of factors must coincide:
        i. The student must elect to engage with the cultural identity center (often, this requires multiple points of engagement)
        ii. The staff of the cultural identity center must broadcast their services to students to ensure awareness. In order to support belonging, they also must generally conduct themselves in a supportive manner
        iii. The university must establish, support, sustain, and promote these centers.
    b. Some version of this reciprocity would apply to many of the behavioral patterns found in the literature. In order for students to attend faculty office hours, for example, faculty must make office hours available, and must ensure they are known to students.
3. Direct intervention guided by Acceptance and Commitment Therapy appears to have some ability to shape both psychological flexibility and sense of belonging for college

students with disabilities. These methods, aside from upfront training requirements for staff, are low-effort and cost, and appear to be positively received by students.

Ultimately, the answers to these questions require further attention and study. Additional, more rigorous, attention should be given to the literature through a more systematic review. A narrative review such as the one conducted in this dissertation can provide an indication of the role of individual behavior in shaping student belonging, but a more systematic review of the literature could identify the efficacy of individual behaviors, potentially including measures of effect size, and giving a better sense of the generalizability of some of these behaviors.

For the application of ACT, a more rigorous approach would require implementation at a larger scale, and a more rigorous scientific control. A future study might design a digitally-accessible ACT-based program for students, and assess the efficacy of access to this programming against a control group. It is also important to assess to what degree programming such as this supports belonging through the intervention itself, and to what degree it supports it through encouraging interaction between students and members of the community. A study involving a control group, a group receiving ACT alongside one to one coaching, and a group receiving coaching without ACT, might better elucidate the impact of ACT methods specifically on the construct of belonging.

In further iteration of a theoretical framework for applying behaviorist methods to sense of belonging, it may be of value, given the grounding of sense of belonging in language, to study sense of belonging through the lens of Relational Frame Theory. Engaging a wide range of perspectives in this pursuit would be the best way to ensure the theoretical basis for approaching belonging through behavioral means is sound.

Outside of ACT and CBS, some efforts are underway in the community of educational scholarship to better understand specific strategies and resources which may support belonging for students with disabilities. An exciting example is disability cultural centers (see, e.g: Chiang, 2020; Saia, 2022). Similar to the identity centers for other minoritized groups which were shown to be pivotal in supporting belonging for these populations in paper two, these cultural centers provide outlets at their universities for disabled students to build community, feel included, and potentially build sense of belonging at their university. As more scholarly attention is devoted to this critical topic over time, it is my hope that additional analogs from the existing literature will emerge, showing new opportunities to support this population on our college campuses.

For universities, there are some valuable lessons from the components of this dissertation.

One: Sense of belonging, though described as an individual experience, is a collective responsibility. The reciprocal nature of behaviors which support belonging indicates that universities seeking to prioritize the growth of belonging within their community must do so by leading from the top – first, by emphasizing and setting it as an institutional value; second, by guiding the development of policy around the support of students' sense of belonging; and third, by encouraging, training, and supporting individual faculty and staff in the individual behaviors which continue the work of building sense of belonging.

Two: the support of sense of belonging may require tailored approaches for specific student populations. For minoritized students, cultural identity centers are demonstrably valuable in establishing a point in the community where these students feel at home, which can have cascading impacts on their broader feeling of belonging within the university. For students with disabilities, direct support addressing their needs may be more relevant. This can in part be accomplished through support for accommodations, universal design, and institutional

accessibility, but may also be achieved by directly developing skills within students, such as psychological flexibility. For all students, being aware of student behavior that is conducive to finding or building belonging may help institutions communicate, encourage, or in some cases develop these behaviors within students.

And finally, that at some level, the actions of every member of the community shape the sense of belonging of every member of the community. Only by understanding, assessing, and seeking to promote prosocial interactions within this community can universities ensure they have set themselves up to be a place where all of their students belong.

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Chapter 5

Chiang, E.S. (2020). Disability cultural centers: How colleges can move beyond access to inclusion. *Disability & Society, 35(7),* 1183-1188.

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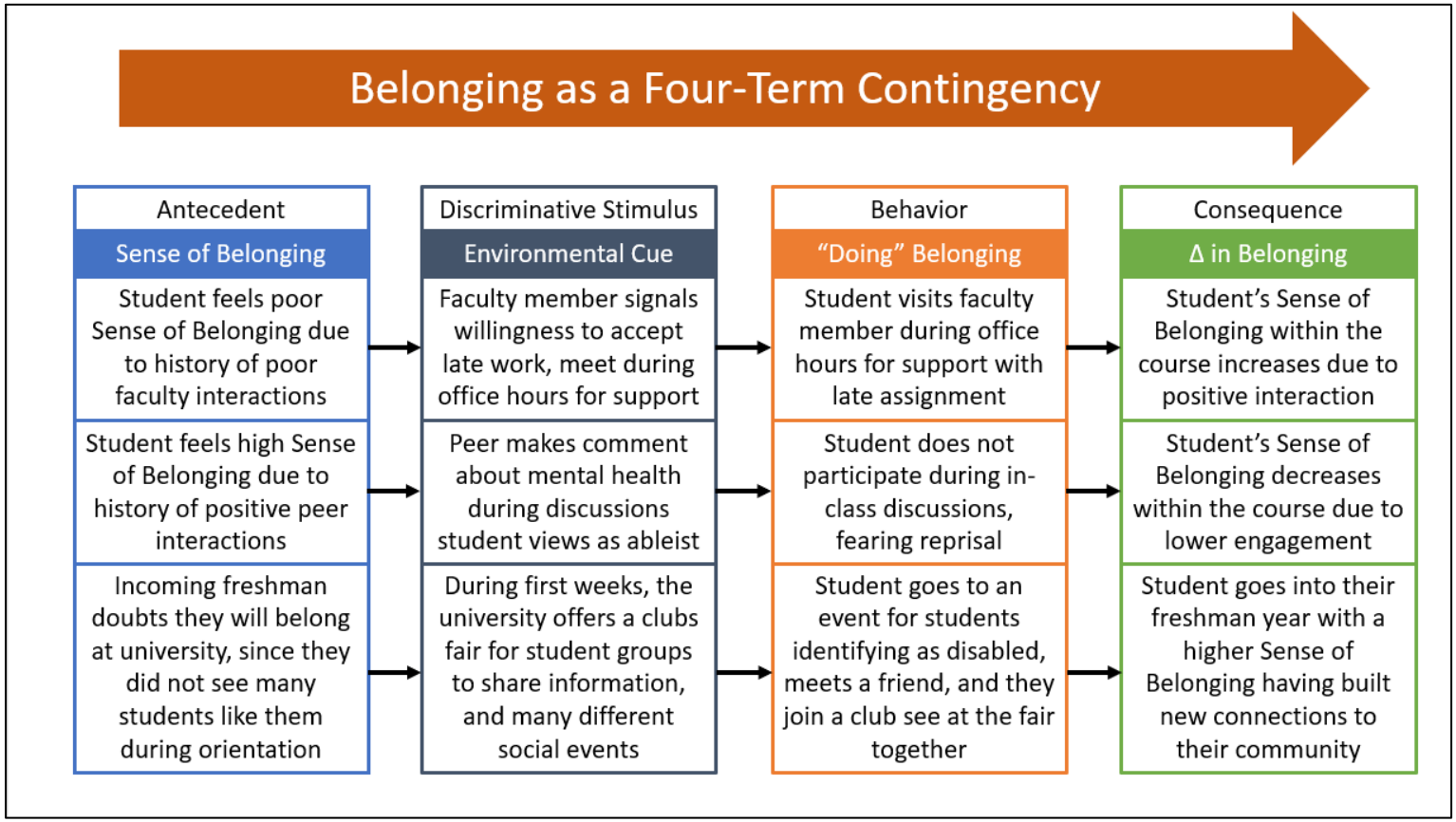
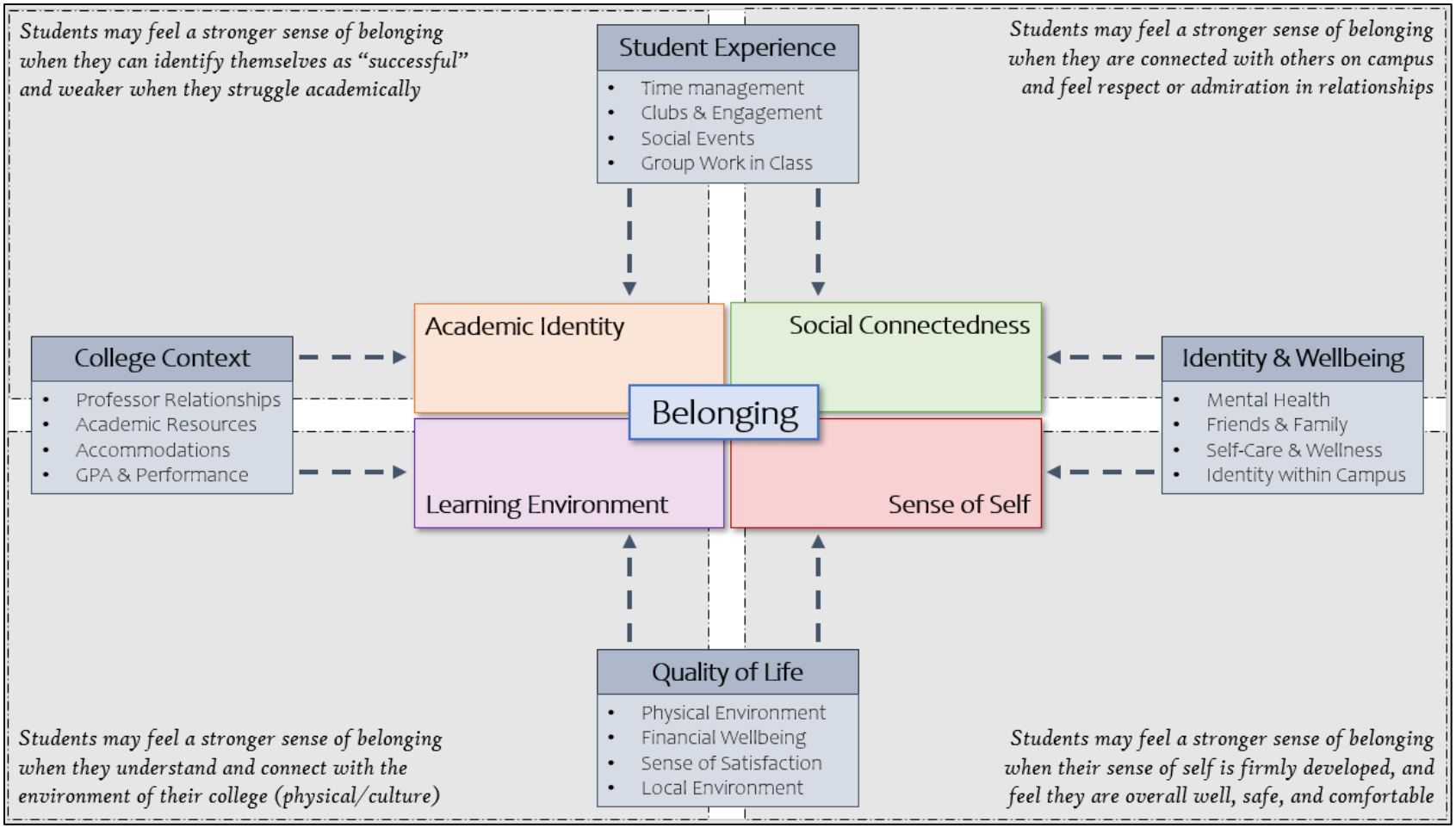
APPENDICES

Appendix A: Introductory Paper Models

Belonging Model – 4 Term Contingency



Belonging Model – Domains of Belonging



Appendix B: Paper 1 – Concept Analysis Table

Selecting a concept
Sense of Belonging
Determining the aim of the analysis
Understanding sense of belonging as a behaviorist concept
Identifying all possible uses of the concept
Belonging is known to intersect with, and is discussed in, various areas to which behavioral intervention is applied. Chief among these is education, which is the central focus of this analyses, but similar efforts could be undertaken in other contexts.
Determining the defining attributes
Belonging is generally understood as a student's level of connection with, or acceptance by, their community. A behavioral analogue to this would be the student's learning history, or history of reinforcement.
Identifying a model case
Social Skills Group:

Belonging may influence the effectiveness of a generally evidenced-based social skills activity among autistic college students. Those who feel a higher level of belonging may engage more readily in the programming, and make progress more quickly and consistently.
Identifying additional cases
Good Behavior Game: Students in the Good Behavior Game may have their willingness to participate impacted through sense of belonging. Those who feel a higher sense of belonging are more likely to persist through frustration to benefit their peers, while those who do not may be unmotivated by or mistrustful of the promised reinforcement. *Student Success Course:* Efforts to drive class participation through a commonly successful conversation curriculum may be stymied by the belonging experience of students in the class. Students who do not feel a high level of belonging may simply be less comfortable participating with peers, who may feel unsafe to them as a result of that isolation.
Identifying antecedents and consequences
Belonging is recursive - the consequence of each interaction serves as an antecedent to the next interaction, and sense of belonging is shaped iteratively. In addition to these consequences, lowering or raising the sense of belonging of students may have impacts on academic performance, retention, etc. as outlined within the literature.

Defining empirical referents
Belonging can be observed and measured through both direct observation of the individual student's own narratives, and indirectly through the way in which their academic performance, social engagements, and factors known to be influenced by belonging are shaped in correspondence with that report.

Appendix C: Paper 2 – Literature Review Tables

Table 1	***Student Behaviors that Support Increased Sense of Belonging***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Faculty Interactions		**38**	Interested, Empathetic, Supportive, Caring, Understanding, Aware
	Mentoring	10	
	Office Hours	6	
	Resource Seeking	5	
	Research Engagement	5	
	Class Participation	4	
Peer Interactions		**31**	Community, Trust, Social, Connected,
	Study Groups	8	Close, Friendly, Supportive
	Cohort Programs	4	
	Peer Mentoring	4	
Student Organizations		**27**	Community, Supportive, Opportunity, Identity
	Student Leadership	8	
	Athletics	6	
	Greek Life	5	
	Service Organizations	4	
Campus Engagement		**22**	Supportive, Available, Understanding
	Use of Resources	7	
	Identity Centers	13	
Community Engagement		**13**	Community, Identity, Engaged
	Service Learning	4	

Table 2	***Faculty/Staff Behaviors that Support Increased Sense of Belonging for Students***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Out of Class Interaction		28	Supportive, Attentive, Aware, Encouraging, Knowledgeable
	Mentoring	10	
	Office Hours	6	
	Proactive Outreach	5	
	Recognition out of Class	4	
Within Class Interaction		14	Supportive, Encouraging, Trust, Attentive, Available, Understanding, Empathetic, Caring, Interested
	Collaborative Classrooms	7	
	Course-Based Research	5	
Resource Sharing		10	Supportive, Helpful, Attentive
	Financial Resources	4	
DEI Commitment		8	Supportive, Identity, Kind, Understanding
	Identity-Affirming Statements	4	
	Inclusive Language	4	
	Diverse Examples	4	

Table 3	***Institutional Behaviors that Support Increased Sense of Belonging for Students***		
Behavior Response Class	*Individual Behavior*	*# Mentioned*	*Qualitative Descriptors*
Identity-Based Resources		31	Welcoming, Diverse, Inclusive, Community
		13	
		12	
	Identity Centers	4	
	Identity-Affirming Programming		
	Professional Development on DEI		
Supportive Programming		24	Welcoming, Supportive, Available
		4	
		8	
	Peer Mentor Programming	7	
	Transition Programming		
	Live/Learn Communities		
Support for Student Access		18	Accessible, Supportive
		4	
		5	
	Financial Resources	5	
	Direct Identity-Based Support		
	Public Resource Information		
Community Building		16	Community, Welcoming, Engaged, Exciting, Fun
		6	
	Res Hall Programming		

Appendix D: Paper 2 - All Included Articles

Article Citation	Exclude/Include
Abrica, E. J., Lane, T. B., Zobac, S., & Collins, E. (2022). Sense of Belonging and Community Building within a STEM Intervention Program: A Focus on Latino Male Undergraduates' Experiences. Journal of Hispanic Higher Education, 21(2), 228–242. https://doi.org/10.1177/1538192720974884	Include
Aggarwal, A., & Çiftçi, A. (2021). Colorblind Racial Ideology, Sense of Belonging, and Racism-Related Stress in Asian Indian International Students. Psychological Reports, 124(5), 2251–2271. https://doi.org/10.1177/0033294120961063	Exclude: Association
Ahmed, M., Muldoon, T. J., & Elsaadany, M. (2021). Employing Faculty, Peer Mentoring, and Coaching to Increase the Self-Confidence and Belongingness of First-Generation College Students in Biomedical Engineering. Journal of Biomechanical Engineering, 143(12), 1–9. https://doi.org/10.1115/1.4051844	Include
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Ardoin, S. (2018). Helping Poor- and Working-Class Students Create Their Own Sense of Belonging. New Directions for Student Services, 2018(162), 75–86. https://doi.org/10.1002/ss.20263	Include
Arellano, L. (2020). Why Latin@s Become Greek: Exploring Why Latin@s Join Latino Greek-Letter Organizations. Journal of Hispanic Higher Education, 19(3), 280–302. https://doi.org/10.1177/1538192718778659	Include
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Banda, R. M., & Flowers, A. M. (2017). Birds of a Feather Do Not Always Flock Together: A Critical Analysis of Latina Engineers and Their Involvement in Student Organizations. Journal of Hispanic Higher Education, 16(4), 359–374. https://doi.org/10.1177/1538192716662966	Include
Barry, A. E., Jackson, Z. A., & Fullerton, A. B. (2021). An assessment of sense of belonging in higher education among student service members/veterans. Journal of American College Health, 69(3), 335–339. https://doi.org/10.1080/07448481.2019.1676249	Exclude: Association

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Bettencourt, G. M. (2021). "I Belong Because It Wasn't Made for Me": Understanding Working-Class Students' Sense of Belonging on Campus. Journal of Higher Education, 92(5), 760–783. https://doi.org/10.1080/00221546.2021.1872288	Include
Blackburn, H. (2017). The Status of Women in STEM in Higher Education: A Review of the Literature 2007–2017. Science & Technology Libraries, 36(3), 235–273. https://doi.org/10.1080/0194262X.2017.1371658	Exclude: Association
BLACKMON, Z. R., O'HARA, R. M., & VIARS, J. W. (2020). Microaggressions, Sense of Belonging, and Sexual Identity in the Residential Environment. Journal of College & University Student Housing, 46(3), 46–59.	Include
Blalock, A. E., Noble, C. E., Chinchilla, J., Flores, A., & Lepe, P. R. (2021). Reconceptualizing student engagement: Supporting diverse students in medical school through holistic approaches. New Directions for Student Services, 2021(176), 71–80. https://doi.org/10.1002/ss.20407	Include
Blaney, J. M. (2022). Cultivating Community College Pathways to STEM Leadership: Examining the Relationships Between Gender, Upward Transfer, and Students' Computing Leadership Identity. Community College Review, 50(3), 269–291. https://doi.org/10.1177/00915521221087283	Exclude: Association
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Bowman, N. A., Jarratt, L., Jang, N., & Bono, T. J. (2019). The Unfolding of Student Adjustment During the First Semester of College. Research in Higher Education, 60(3), 273–292. https://doi.org/10.1007/s11162-018-9535-x	Include
Brazzell, J. C. (2001). A Sense of Belonging. About Campus, 5(6), 31. https://doi-org.proxy.library.vcu.edu/10.1177/108648220100500608	Include
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Wylie, C. D. (2019). Socialization through stories of disaster in engineering laboratories. Social Studies of Science (Sage Publications, Ltd.), 49(6), 817–838. https://doi.org/10.1177/0306312719880266	Exclude: Low reference to belonging
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Appendix E: Paper 3 – Survey Questions

- Question 1: My academic stresses make it difficult for me to live a life that I would value.
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 2: Sometimes I feel as if I don't belong at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 3: People at [University] notice if I am good at something
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 4: People at [University] are friendly to me
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 5: Worries about school get in the way of my success
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 6: Other students at [University] take my opinions seriously
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 7: It is hard for people like me to be accepted at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 8: Professors at [University] respect me

    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree

- Question 9: My emotions affect my academic performance
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 10: Professors at [University] are not interested in students like me
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 11: I feel like I am a part of [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 12: I can really be myself at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 13: I am afraid of my feelings about school
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 14: People at [University] know that I can do good work
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 15: I am treated with as much respect as other students at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 16: I feel proud to be a part of [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree

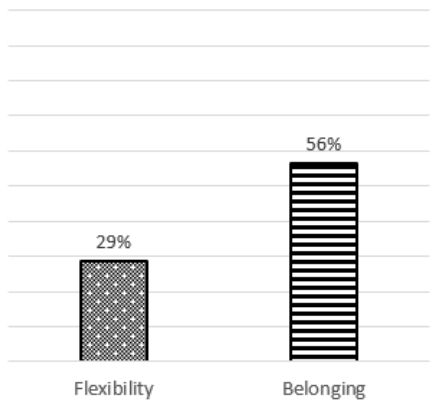
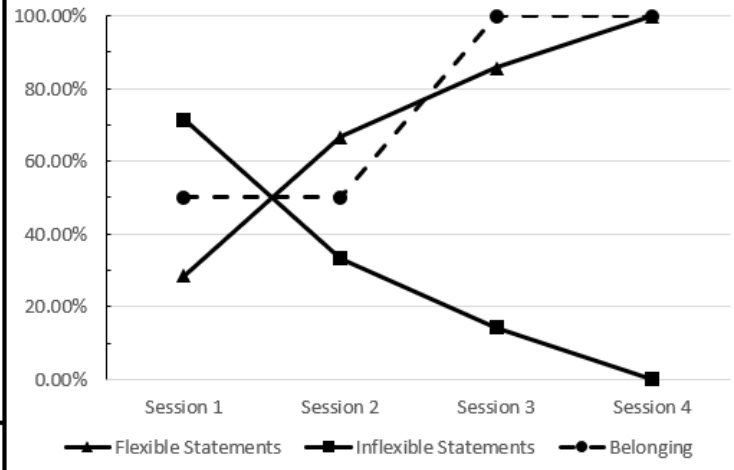
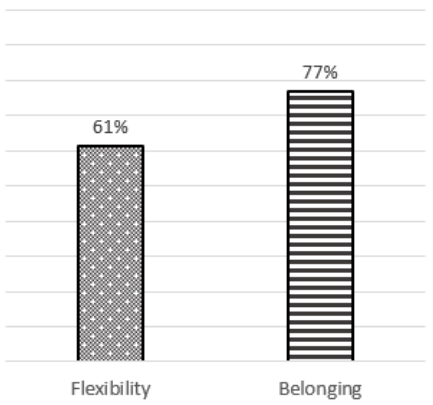
- Question 17: Most students are handling academic stress better than I am
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 18: Other students at [University] like me the way that I am
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 19: I wish I were in a different school
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 20: I am included in lots of different activities at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 21: My academic stresses prevent me from living a fulfilling life
    - Always True, Often True, Sometimes True, I'm Not Sure, Never True, Usually Not True, Rarely True, Never True
- Question 22: My professors at [University] are interested in me
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 23: I feel very different from other students at [University]
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 24: There is at least one professor, staff member, or employee that I can talk to at [University] if I have a problem
    - Strongly disagree, Disagree, Somewhat disagree, Somewhat agree, Agree, Strongly agree
- Question 25: I worry about not being able to control my feelings about school

    - Always True, Often True, Sometimes True, I’m Not Sure, Never True, Usually Not True, Rarely True, Never True

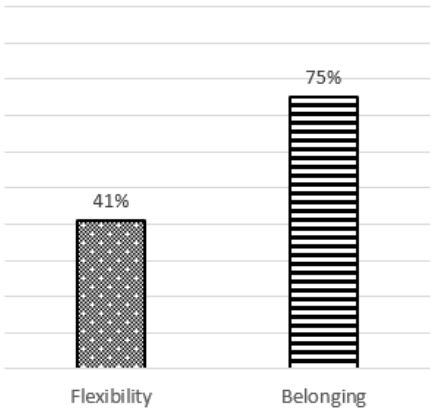
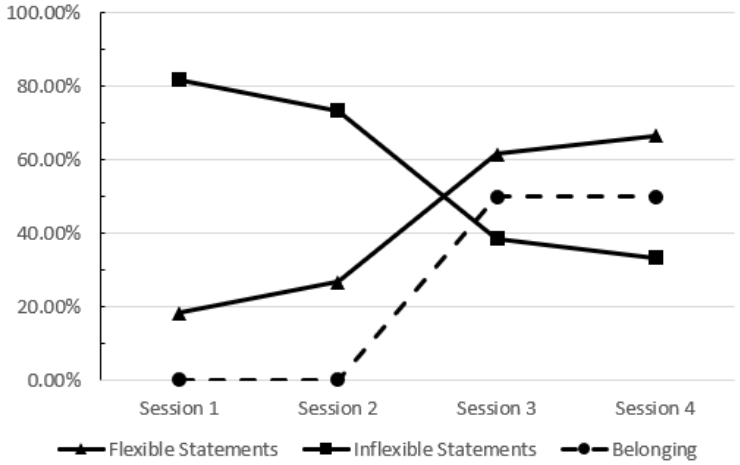
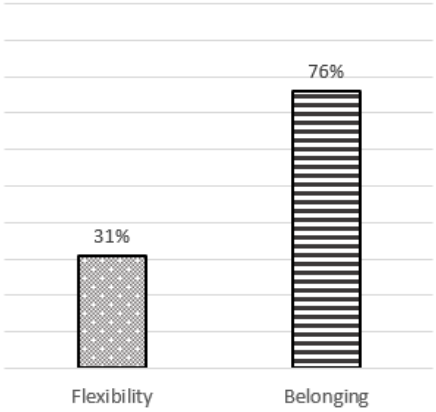
- Question 26: What is it like to be a student at [University]?
    - Open Ended Response
- Question 27: How would you describe your experience of academic stress or motivation as it affects your courses?
    - Open Ended Response

Appendix F: Paper 3 – Joint Displays

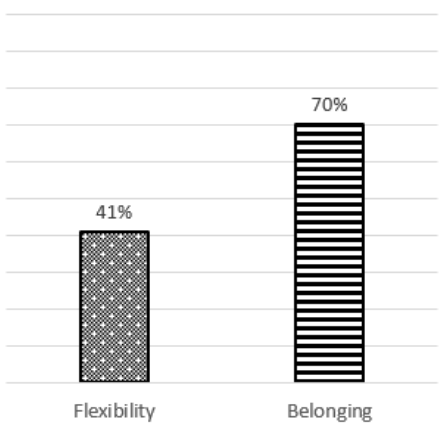
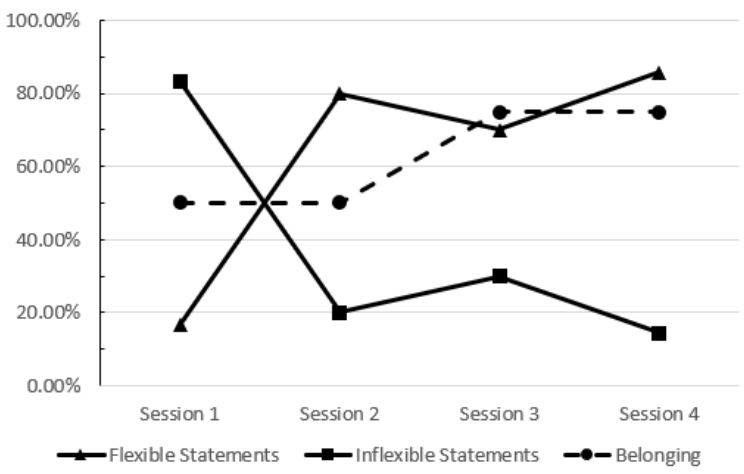
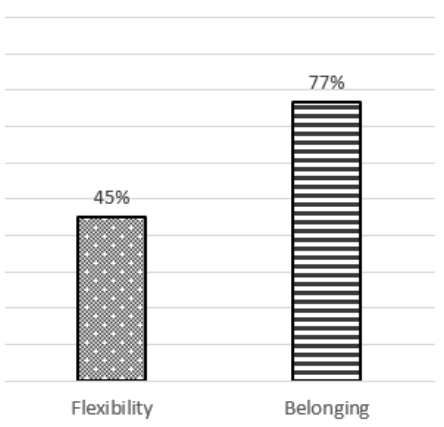
"Marie" Joint Display

<table>
<tr><th>Pre-Intervention Phase</th><th>Intervention Phase</th><th>Post-Intervention Phase</th></tr>
<tr><td>Survey Results</td><td>Flexibility and Belonging Over Time</td><td>Survey Results</td></tr>
<tr><td> 
</td><td rowspan="2"> 
</td><td> 
</td></tr>
<tr><td>Open-Ended Response</td><td>Open-Ended Response</td></tr>
<tr><td rowspan="3">For me it's been quiet. I don't have anyone to talk to and if I do it is mostly pleasantries in passing. I've been finding it hard to make friends here… I feel a lot of academic pressure to succeed because of previous experiences with school, and I get a lot of anxiety and try to work harder.</td><td colspan="2">Within-Session Quotes</td><td rowspan="3">I feel like I can go to campus every day and be whoever I want to be. It encourages me to strive for excellence, but it also gives me the space to be forgiving to myself… I feel relief when I get to campus and am happy to blend in as a small part of a diverse lively community.</td></tr>
<tr><td>Session 1</td><td>Session 4</td></tr>
<tr><td>I don't want to keep letting things affect school. Any kind of curve ball can set me off. I want to learn how to take control over my stress and my life...</td><td>I've been reflecting a lot lately… and like, I'm stressed and all. But I would say I am in the best part of my life that I've ever been.</td></tr>
</table>

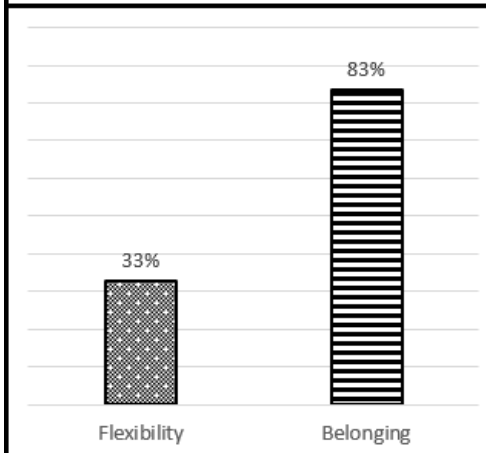
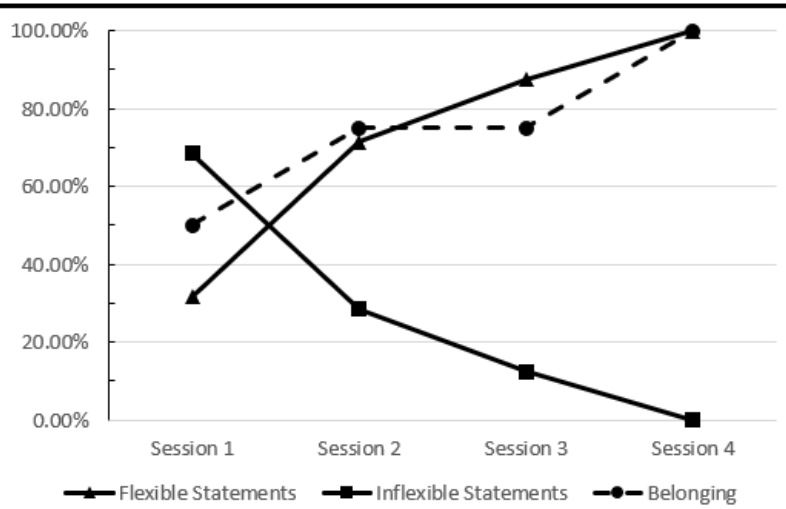
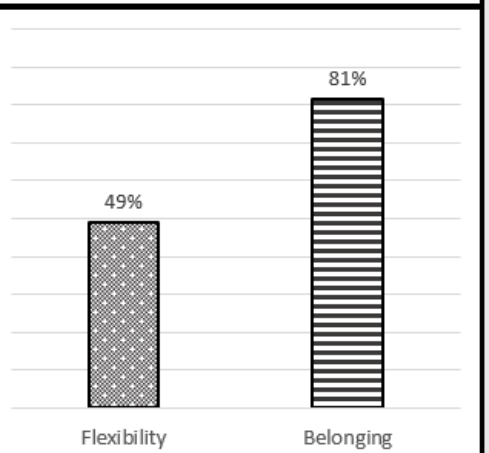
"Quinn" Joint Display

<table>
<tr><th>Pre-Intervention Phase</th><th>Intervention Phase</th><th>Post-Intervention Phase</th></tr>
<tr><td>Survey Results</td><td>Flexibility and Belonging Over Time</td><td>Survey Results</td></tr>
<tr><td> 
</td><td> 
</td><td> 
</td></tr>
<tr><td>Open-Ended Response</td><td></td><td>Open-Ended Response</td></tr>
<tr><td rowspan="2">It's just that there's not a lot of assistance for connecting with others - there is and there isn't. If you are an average person with average social skills there is, but if you aren't there's not much they can do.</td><td colspan="2">Within-Session Quotes</td><td rowspan="2">There are many wonderful things about [University] but the course work is very intense and there is not much social support for people who are socially anxious</td></tr>
<tr><td>Session 1</td><td>Session 4</td></tr>
<tr><td></td><td>I can see everyone else is being affected by [stress] in a similar way. I'm just a bit more activated than they are because they can turn it off and I can't.</td><td>A lot of these activities are very like they're sensory based… So what makes more sense to me is to try and, like, activate my flow state more often</td><td></td></tr>
</table>

"Liyana" Joint Display

<table>
<tr><th>Pre-Intervention Phase</th><th colspan="2">Intervention Phase</th><th>Post-Intervention Phase</th></tr>
<tr><td>Survey Results</td><td colspan="2">Flexibility and Belonging Over Time</td><td>Survey Results</td></tr>
<tr><td> 
</td><td colspan="2"> 
</td><td> 
</td></tr>
<tr><td>Open-Ended Response</td><td colspan="2"></td><td>Open-Ended Response</td></tr>
<tr><td>I think personally, I take a lot of stress on with my academics. I am hard on myself and I always notice when a test is coming on, I can't do anything but worry. It's not that I can't study, but the worry is constant. The worry makes me lapse in other areas of my life.</td><td colspan="2">Within-Session Quotes</td><td>I feel that academic stress does tend to sometimes weigh me down, however if I manage my stress I normally feel motivated to take on more. Difficult courses make me less motivated to do work, because I feel I have to put in more energy than I have into studying.</td></tr>
<tr><td></td><td>Session 1</td><td>Session 4</td><td></td></tr>
<tr><td></td><td>With my chronic illness sometimes school takes too much time out of my day, it's hard to take care of myself… And then that in turn affects my study.</td><td>I notice that I still feel anxious over small things. But even when that's happening I'm able to follow through on the work that I have.</td><td></td></tr>
</table>

"Amber" Joint Display

<table>
<tr><th>Pre-Intervention Phase</th><th colspan="2">Intervention Phase</th><th>Post-Intervention Phase</th></tr>
<tr><td>Survey Results</td><td colspan="2">Flexibility and Belonging Over Time</td><td>Survey Results</td></tr>
<tr><td> 
</td><td colspan="2"> 
</td><td> 
</td></tr>
<tr><td>Open-Ended Response</td><td colspan="2"></td><td>Open-Ended Response</td></tr>
<tr><td>I feel like my stress and anxiety can cause depressive episodes which limit my motivations and emotions… The stress and depression can cause me to not take care of myself, and then others worry about me. It's something I can't do anything about.</td><td colspan="2">Within-Session Quotes</td><td>I always get really stressed out over minor things, and never had methods that worked for me. The stress tired me out and wore me down and prevented me from working hard. The study gave me methods to use, and now I don't have to miss classes or step out 'cause I'm uncomfortable!</td></tr>
<tr><td></td><td>Session 1</td><td>Session 4</td><td></td></tr>
<tr><td></td><td>I'm trying to convince my brain that it's not stressful… I knew what I was getting into when I started it, but I still haven't gotten over that yet.</td><td>I thought about a checkerboard or a chess board... I can make a list of good and bad per day. I mean, usually the good would outweigh the bad.</td><td></td></tr>
</table>

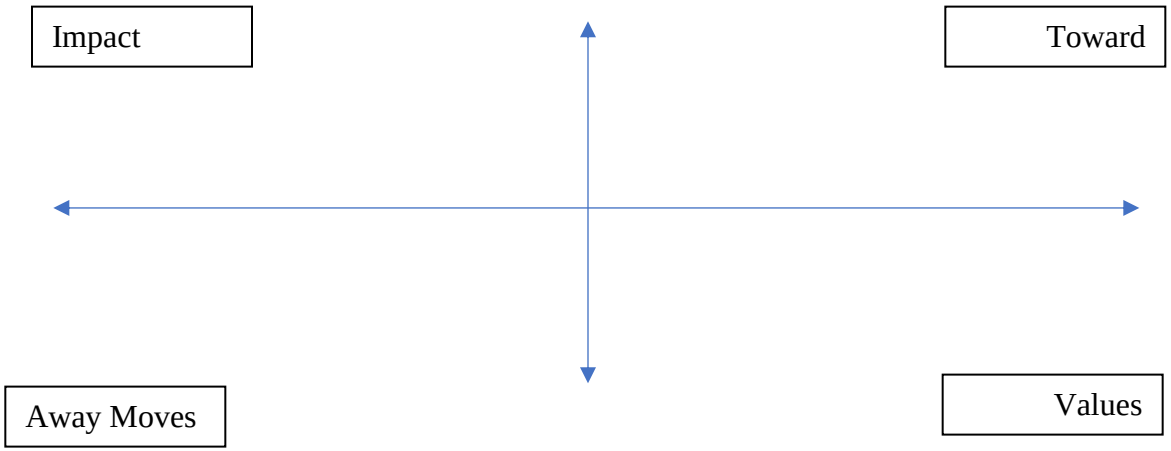
Appendix G: Paper 3 – Intervention Exercises

Session 1: Engaged Dimension (Values & Committed Action)

Activities in this session are focused on identifying participant values, and helping them identify committed actions which support those values. Participants will not have the ability to select from multiple options within this session – the ACT Matrix is a widely used activity that has demonstrated effectiveness in identifying values, and goal setting will help identify specific action in support of those values. This session is first to provide a centering point (and means of evaluating efficacy and social validity) for other sessions.

Activity 1: ACT Matrix

The ACT Matrix is a guided activity in which participants fill out a 4-square matrix to identify both their values and the things in their lives which support or detract from those values. A blank matrix looks something like this:



To complete the matrix, the researcher will guide the participant through questions such as:

1. Values:
    a. What kind of person do you want to be?
    b. What drew you to your major? What do you want to do?
    c. What is most important to you?
2. Towards Moves:
    a. What does it look like to act on that value?
    b. What does a good day look like?
    c. What kinds of things do you do that get you closer to this?
3. Away Moves:
    a. What does it look like when you aren't acting on that value?
    b. What does a bad day look like?
    c. What kinds of things do you do that take you away from this value?
4. Impact:
    a. What is that like for you?

Activity 2: Goal Setting

This activity provides a framework for guiding the students toward committed action based on their values. For each value identified in the Matrix Activity (if a large number are identified, the student may be asked to focus on a maximum of 3 during session, and when time has ended for this activity, we will transition to next. Students will be able to complete goal setting for other values on their own if interested in doing so).

For each value, students will identify 4 goals – these goals are tied to the dimensions of belonging identified as targets for this study:

Goal 1: What is something I can do to live on this value within my classes/academic career?

(Examples – make a study plan, take better notes, talk to professor)

Goal 2: What is something I can do to live on this value with my friends and family?

(Examples – set up a regular phone call, join a club, make new friends)

Goal 3: What is something I can do on campus to live this value?

(Examples – visit new places, try new things, volunteer)

Goal 4: What is something I can do to live this value for myself?

(Examples – set aside time for mindfulness, take a walk, go to the gym regularly)

The goals and values identified in these activities will be referred to as reference goals in the context of weekly check-ins and other activities. A student meeting these goals should be understood as an informal measure of intervention success.

Session 2: Aware Dimension (Present Moment Awareness & Self as Context)

Activities in this session are focused on helping students center their awareness on the present, and identify thoughts driving stress as separate from themselves. Participants will be able to select from a set of different options within each kind of activity to fill their 20

minutes. Some activities are shorter than others – in the event that 20 minutes are not needed and there is not time to conduct a new activity, the research staff will spend time discussing awareness with the student more broadly.

Activity Options: Metaphor & Language

The Chess Board

For this activity, we will "play" a brief game of chess. Let the white pieces represent the thoughts that cause you stress, and the black pieces represent the thoughts you use to try to address that stress.

(We will have a brief discussion of what those thoughts might look like).

It's up to you which side of the board you want to play. I'll play the other. It's alright if you're not familiar with the rules *(are you familiar with your mind's rules?)*! We'll play for about 10 moves and then stop.

(We will check in during the match to see what thoughts are coming up. When a stress-piece takes a de-stress piece, what is that like? What is it like when the de-stress piece "wins"?)

There are a lot of times during the day when our minds can feel a bit like this. We put our "bad" thoughts and our "good thoughts" against each other. You probably have a team you're loyal to. But what happens if we knock over the board?

You'd be right to notice that all the pieces are still there. Eventually, you're going to clean up and the pieces will be back where they were. But so is the board. Which are you? *(You are the board – you are the context where your thoughts are placed).* The next time

you're having one of those conflicts between your good and bad thoughts, I'd like you to try and remember this moment. Try to think of your mind as a chessboard, and let your thoughts play out. If you're not happy with who wins, remember that you can play another match at any time.

Instagram Feed

Imagine you're scrolling through an Instagram feed, and each picture is a moment from your life. If you think in text and it is easier for you, you can also imagine this as a twitter feed with short descriptions of events. You can close your eyes if that helps you, but it's not required. As you scroll down, you probably see a lot of different memories. Maybe your first day at VCU. The first time you met a good friend, or the last time you saw one. A childhood pet. Graduation.

(We will have a brief discussion of what those thoughts might look like).

Notice that your feeling about each picture is a little bit different. Some might be happy memories. Some might be bittersweet, or even sad. Try to capture those feelings, and put them in their own posts between your memories. What do those feelings look like? What is it like to see them?

There are a lot of times when our thoughts can be a bit like this. We're scrolling through old memories, or even just reacting to things

that happened that day. It can feel a bit like late-night doomscrolling, only it feels a lot harder to turn off the phone. Does that seem right to you?

I want you to think a bit about this experience. Where do you see yourself in this metaphor? *(You are not the posts, you are the feed).* The next time you're having one of those moments, try to remember that you are not the posts, or the pictures, or the text – you are the platform. You're the place where these things happen.

All Aboard the S.S You

Think about a cruise ship, leaving the dock – if it's easier for you, you could also picture a train. If it helps you to close your eyes, you can do that, but it isn't necessary that you do. Think about the honk of the train horn, or the steam from the cruise liner. A whole crowd of people lined up to watch it leave. Now think about yourself, sitting in a cabin on the boat, or on the train. Try and put some of the people in your life in that crowd watching you pull away. What are you thinking about them, waving as you leave?

(We will have a brief discussion about this)

Notice that, in this metaphor, this is just a trip. A vacation. You're going to come back, and you'll have new thoughts about them when you return. Now I'd like you to think about the other windows on your boat or your train. Each of them has another person, a stranger, watching their own family and friends. What are your thoughts about them? What are your thoughts about yourself, sitting in that cabin?

(We will have a brief discussion about this)

Do you think your thoughts will change about those people on your trip? Do you think your thoughts about yourself will? *(They will*). Now, think about the whole picture. The boat, your body in that cabin, your family, the strangers. You have thoughts about all of these images, but who hears those thoughts? *(I do*). So, are you the person in the cabin, are you your thoughts, or are you the boat, holding it all? *(I am the boat*). The next time you're noticing a big change, the start of a new journey for yourself, try and remember this! You are the context for your thoughts, and not the thoughts themselves.

Activity Options: Guided Meditation & Mindfulness

Memory Tourist

We're going to spend time revisiting an old memory. You can think of this as guided meditation. Try and keep your breath steady, breathing in your nose and out through your mouth while we do this. Let's practice that a few times. *(Practice).* As we do this exercise, it might help you to close your eyes – if you aren't comfortable doing that, it isn't required, but you may find it helpful.

I'd like you to picture a place that you've been many times. It could be somewhere at home, somewhere on campus, a favorite restaurant or place you walk your dog. Tell me a little bit about that place.

(We will talk briefly about your memory)

Alright – as you imagine this place, I'd like you to imagine you are walking through it for the first time. See what you can notice in this memory. Let's leave some time for you to do that. Really try to focus on your senses – what can you see? What can you hear? Smell? Taste? Feel? I will do this too, with my own memory.

(We will leave time for you to explore in peace)

Tell me one thing you noticed with each sense. *(Time to describe).* What was it like, being a tourist in this memory? Do you think you would be able to bring that sense to your day to day life sometimes? What would that be like? Periodically during your day, I would challenge you to try to be a tourist. Take note of what you can observe with each sense.

Your Left Foot

We're going to spend time noticing things about the body. You can think of this as guided meditation. Try and keep your breath steady, breathing in your nose and out through your mouth while we do this. Let's practice that a few times. *(Practice).* As we do this exercise, it might help you to close your eyes – if you aren't comfortable doing that, it isn't required, but you may find it helpful.

Sit comfortably in your chair. Notice the way it feels against you in the places where it is touching you. Is it hard? Soft? You don't need to answer, for now, just observe. Notice the temperature in your room. Is it cool? Warm? Does the air feel dry? Humid?

Now, I'd like you to put your attention on your left foot. Go ahead and wiggle your toes, or arch your foot. Move it in a way that is comfortable for you. Notice the sensations that come with this, but you don't need to describe them to me right now. Just notice how your foot feels to you. Is it sore, from walking? Do your socks feel itchy? Soft? What do you notice about your shoe?

Now shift your attention to your hand. Move your fingers in any way that feels natural. Grip your chair. What does that feel like? What do you notice?

If you've closed your eyes, go ahead and open them. Feel free to respond now. How easy was it for you to shift your attention from the room to your foot? From your foot to your hand? Are you your foot? Are you your hand? *(No, you are not).*

The next time you experience difficult thoughts, see if you can shift your attention the same way you did today. You could even shift it to your foot! Just like with your foot, remember that thinking about your hand didn't make your foot go away. But you were able to direct your attention. Just like you are not your foot, you are not your thoughts. You are the thing that notices your thoughts.

Session 3: Open Dimension (Acceptance & Defusion)

Activities in this session are focused on helping students take a more open stance on both experiencing stress and difficult thoughts, and identifying the content of their thoughts as distinct from reality. Participants will be able to select from a set of different options within each kind of activity to fill their 20 minutes. Many activities are shorter than others – in the event that 20 minutes are not needed and there is not time to conduct a new activity, the research staff will spend time discussing awareness with the student more broadly.

Activity Options: Metaphor & Language

Name Your Mind

During the day you probably hear a lot from your mind. It's probably sharing some thoughts with you right now. What kinds of things is it telling you now?

(We will discuss this briefly)

Try and think about some of what we learned last week. Are those thoughts you? *(No)*. You are the thing that hears these thoughts. It's easy to forget that, though! It can be helpful to think of your mind as an old friend who you're having a conversation with. Think for a minute about what name you might give your mind. *(Take time to think*)

Now let's think about those thoughts we were having earlier. Practice saying "[Mind Name] says…". Sometimes, our minds can be real jerks. It can be helpful to call them out when that happens. The next time you catch [Mind name] being rude, just say that. [Mind name]'s being kind of a jerk today. Be sure to thank them when they're nice, too!

Coke Coke Coke

This activity may feel a little silly, but that's part of what makes it helpful. Let me know if it feels too silly, and we can do a bit less goofy version of it.

What is your favorite soda? (For sake of protocol, let's assume Coke). Alright, great. Take a moment to think about a nice, cold, can or bottle of coke. Try and picture the cold feeling against your hand, and the feeling of condensation on your fingers. The fizziness as you drink it, the taste of it. Can you picture that? What is it like to picture it?

(*We will briefly discuss*)

Here's the part where things get a little bit silly. We can do this together, or you can do it alone, whichever feels better for you. I'd like you to spend the next minute, all of it, saying the name of that soda over and over. Coke, Coke, Coke. Whenever you're ready (*practice*).

Did you notice anything about that? As time went on, could you still taste it? Did you feel like you had a can with you?

Our thoughts can feel very, very real. When we first thought about coke, I bet you really wanted one. I bet you could practically taste it like you did have one with you. But, after repeating it a lot it becomes easier to see that that thought isn't real. The next time you have thoughts that are bringing stress for you, you might try to practice this! Head somewhere you can be alone, and just repeat that thought to yourself until you can see it for what it is – a thought.

Your Favorite Song

This activity may feel a little silly, but that's part of what makes it helpful. Let me know if it feels too silly, and we can do a bit less goofy version of it.

First, tell me something that's been on your mind lately that is causing you stress – something connected to school. What is that stress like? Do you find it hard to be present with that thought?

(We will briefly discuss)

Alright, we'll hold onto that for later. This is the part that can be a bit silly. Can you sing a bit of that song for me? The chorus, maybe. If it's a hard song to sing, feel free to choose a different song for this activity. *(Practice)*.

Great, it seems like you know that song. We're going to try something a bit different. Instead of singing the normal lyrics, I want you to start with that thought that's a bit stressful. Keep going on it as best as you can, to fill in the rest of the chorus. If you like, I can give you an example. Take some time to think, and when you're ready, Sing. *(Practice).*

What was that like for you? Often times, we can change our relationship to things that stress us out by making them a bit silly. If you don't like singing, you could just say them in your silliest accent. Sometimes, doing that is enough to make it feel less powerful.

Activity Options: Guided Meditation & Mindfulness

I Can't Dance

This activity may feel a little silly, but that's part of what makes it helpful. Let me know if it feels too silly, and we can do a bit less goofy version of it.

Sometimes, our minds tell us that something isn't possible for us. That we can't do it. What kinds of things does your mind tell you you can't do?

(We will discuss this briefly)

Ok. Now, here's the silly part. When I tell you, I'd like you to raise your left hand. While you do that, I'd like you to say, out loud, "I can't raise my arm". *(Practice)*. What was that like? Could you raise your arm? *(Yes)*. Ok, let's try another one. When I tell you, I'd like you to stand up. While you do that, I'd like you to say, out loud, "I can't stand up." *(Practice)*. What is that like?

Alright, last part. It's ok if you don't dance a lot, but I'm going to ask you to dance now. If you'd like me to dance at the same time, I'll do that. If you'd rather dance alone, that's fine. But the whole time you, or we, are dancing, we'll be saying "I can't dance." If you'd like, you can say each thing you do. If you do the robot say "I can't do the robot". If you do the running man, say "I can't do the running man". We'll do this for about a minute, whenever you're ready.

(We will do the activity)

Great, let's sit. What was that like? Did you notice that no matter how many times you said you couldn't do something, or I said I couldn't, that we could? The next time your mind tells you that you can't do something, try and remember this! Try and remember that just because your mind tells you you can't do something, doesn't mean you can't.

Leaves on the Stream

We're going to spend time noticing our thoughts. You can think of this as guided meditation. Try and keep your breath steady, breathing in your nose and out through your mouth while we do this. Let's practice that a few times. *(Practice)*. As we do this exercise, it might help you to close your eyes – if you aren't comfortable doing that, it isn't required, but you may find it helpful.

I'd like you to picture a river, or a stream. It can be somewhere you've been, somewhere you've spent a lot of time, or it can just be your idea of a river. Try and notice the sounds of the water. The way it smells, maybe. The way the light plays on the surface of the water. Take a moment to get familiar with this river, and when you're ready, just give me a little nod. *(Practice)*.

Great. Now, take some time to notice your other thoughts. Don't lose the river, but let your other thoughts come through, whatever they are. Maybe you're hungry. Maybe you think this is silly. Whatever they are, just observe them. *(Practice)*. Now, for each of these thoughts, put a leaf in your river. There's the leaf that says you forgot to reply to that text. There's the leaf that says you need to study for that test. Let the leaves float along your river, and float downstream. I'd like you to spend a minute or so on this. *(Practice)*.

What was that like for you? Was it easy? Was it difficult? How did it feel? The next time you're feeling your thoughts outpace you, or come on fast enough they are causing stress, you can use this to slow yourself down. Take a moment, close your eyes, and remember that you aren't the leaves – you're not even the tree the leaves come from! You're the river.

Session 4: ACT Overview

The structure of this session is somewhat different than others – the goal is not to convey new information about a domain of psychological flexibility, but to summarize the process holistically. Rather than two activity blocks, we will devote the first activity

block to a structured discussion of ACT. I will explain the dimensions, and what implications they have for us. Afterwards, we will work on a plan for how (or if) the participant wants to carry what they've learned forward.

ACT Summary

Over the course of our sessions, we have been focused on finding ways to be more flexible – that flexibility is in service of helping you connect to the values we talked about in that session, so that you can reach some of those goals – and continue to set new ones, living within those values. This is part of a framework called ACT – Acceptance and Commitment Training. ACT talks about 6 dimensions of flexibility, and I'd like to tell you a little bit about them.

Values: This was the first thing we talked about together – you'll remember our matrix activity from the first session. Values are the priorities we choose for our lives. Unlike goals, you don't really "finish" with values. They're things like "being a good friend" or "living a life that helps others".

Committed Action: These are the actions we take that make those values happen – it's the goal of ACT to help people be able to consistently engage in that action. Goals can be committed action! For example, if we have the value of living a life that helps others, we might choose to become a doctor, or a therapist. We might also choose to volunteer with local charities to support their efforts.

Put together, we think of these two things as being "Engaged" with our lives.

Present Moment Awareness: This dimension is all about keeping our thoughts grounded in here and now, rather than worrying about the future, or ruminating about the past. Either of those things can be a barrier to committed action – it's harder to engage if we're worried we'll fail! Sometimes, by grounding our focus (like by leaning on our five senses) in what's happening right now, we can help ourselves return to that engagement.

Self as Context: One of the big ideas of ACT is that "we are not our thoughts". You probably heard some version of that in a lot of our activities. ACT practitioners believe that the thing that is "you" is the thing that hears your thoughts. It's a bit like listening to the radio. It isn't important that you believe this, necessarily, but it can be helpful to practice it sometimes. By making distance from our thoughts, we can understand them better. We can learn when they're helping us, and when they aren't.

Put together, we think of these two things as being "Aware" of ourselves and the world around us.

Acceptance: This is the willingness to be present with, and just observe difficult experiences and emotions. It doesn't mean that we have to just tolerate them and not try to prevent them from happening! Improving our lives to avoid these situations is a great committed action. However, sometimes you'll have negative experiences you can't control, or didn't expect – or ones you tried to prevent, but weren't quite successful. It's important to be able to be present with these sometimes, to learn how to move forward from them.

Defusion: This is a bit like what we learned from Self as Context – it's the idea that our thoughts are thoughts, and not necessarily a statement of reality. I could say, right now, that the sky is blue. I can hold that thought in my head. I can think "I can't dance", but I

definitely can! The major goal of this step is for us to be able to assess whether our thoughts are helping us. If they aren't, we can thank them for trying and move along to the next thing. Leaves on a stream!

Taken together, this is an approach to something called psychological flexibility. I'm curious to know what you've learned (it's ok to say nothing!) from working on this with me, and if you've found any of it useful.

(We will briefly discuss)

Activity Options: Summary Activities

Alright! Our last activity together is to make a plan on what, if anything, you'd like to incorporate from this into your day to day life. If the answer is nothing, that's ok! We can skip working on this, and just have our last conversation and a shorter meeting. If you do want to make a plan, here's what we can do.

We are going to work on a list together of things you want to do, inspired by your values. I'd like us to think of one tiny thing, something you can do today. One medium thing, that you can do before the end of the semester. One big thing, that may take longer. And one huge thing, that you can work toward and maybe never reach. Let's brainstorm those for a bit:

(We will discuss this here).

Now, if you're willing, I'd like you to tell me which dimensions of flexibility you think would support you in meeting these goals. If you're not sure, that's fine! I can give some suggestions

(We will discuss this here).