

Sense of belonging in doctoral education: a scoping review

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Abstract

Purpose – Sense of belonging has attracted significant research attention in higher education, as it is associated with various positive student outcomes. This paper aims to review the literature on sense of belonging at the doctoral level and seeks to understand how belonging is conceptualised as well as factors and outcomes associated with it.

Design/methodology/approach – The authors' used a scoping review approach to search for relevant literature from major databases and journals in higher education in February and March 2024. From an initial 1202 items, further abstract and content screening resulted in 24 articles to be included in the review.

Findings – The review indicates that the conceptualisation of belonging reflects existing literature with some specificities of the doctoral context. Factors associated with sense of belonging fall into five themes: academic factors, social connections and experiences, physical location and space, personal factors and culture. A sense of belonging is reported to have a positive impact on mental health and wellbeing, engagement and satisfaction with doctoral studies, course retention, academic self-concept and teaching career aspirations.

Originality/value – The review offers a nuanced understanding of this concept for future research and practices. Insights from the factors associated with belonging can inform institutions and staff working with doctoral candidates in designing meaningful opportunities to foster a sense of belonging.

Keywords Scoping review, Doctoral education, Sense of belonging, Doctoral experience

Paper type Literature review

Introduction

A sense of belonging is one of the basic human needs that is central to how we live and connect (Cohen, 2022). In the higher education context, research has suggested that a sense of belonging is associated with various positive outcomes for undergraduate students, including improvement in engagement, retention and academic outcomes (Allen *et al.*, 2024; Crawford *et al.*, 2024). Thus, improving students' sense of belonging has been one of the key concerns for many universities (Crawford *et al.*, 2024; Kahu *et al.*, 2022). While literature on belonging at the undergraduate level is ample, research on belonging at the doctoral level remains scant. This topic has not been explicitly addressed in the reviews of the doctoral experiences (Brownlow *et al.*, 2023; Sverdlik *et al.*, 2022), leaving a gap in the sense of belonging at this particular level.



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While existing research on sense of belonging at the undergraduate level is informative (Allen *et al.*, 2024; Taff and Clifton, 2022), they do not fully reflect the nature and complexity of PhD studies. For example, the doctoral experience has been described as liminal, a period when someone is “stuck” before transforming their understanding and identity, resulting in a feeling of isolation, lack of confidence and imposter syndrome (Keefer, 2015). On an individual level, the average age of a PhD candidate is often higher than that of an undergraduate student, who is more likely to have more professional experiences and personal responsibilities (Universities Australia & Australian Council of Graduate Research (ACGR), 2024). This means, for example, a mature-aged person with a strong professional identity, life experience and family responsibilities may experience the PhD differently and their sense of belonging is more likely to be impacted in a more complex way (Sverdluk *et al.*, 2018). Research has reported a high prevalence of mental health and wellbeing issues, such as depression and anxiety, in the doctoral candidate population (Jackman *et al.*, 2023; Levecque *et al.*, 2017; Satinsky *et al.*, 2021). According to a survey of more than 2,279 graduate students (including 90% PhD students) from 26 countries, “graduate students are more than six times as likely to experience depression and anxiety as compared to the general population” (Evans *et al.*, 2018, p. 282).

Relatedly, the PhD candidates’ challenges are associated with doctoral attrition, a recurrent concern in doctoral education (Jones, 2013; Mensah, 2025). Current literature in graduate studies suggests that sense of belonging can play a role in doctoral attrition. The lack of belonging is often associated with isolation, whether social or intellectual, which is one of the main factors associated with doctoral attrition (Rigler *et al.*, 2017) and withdrawal (Alves *et al.*, 2024). The sense of isolation itself can pose a barrier to doctoral candidates’ integration into the department and their access to the necessary support systems (Ali and Kohun, 2006; Rigler *et al.*, 2017). As research in the US has shown, the question “Do I belong here?” – whether they feel fit and integrated into the department – often arises when a candidate is socialised into graduate school (Ali and Kohun, 2006; Golde, 1998). In addition, this issue is more likely to influence the doctoral experience differently across various systems where supervision and support are structured differently (Shin *et al.*, 2018). In contrast, having a sense of belonging can positively contribute to the doctoral experience and motivation to study. For example, sense of belonging has been shown to strongly correlate with overall satisfaction of postgraduate researchers, as suggested by a recent large-scale survey in the UK (Neves, 2023). The low score on belonging, according to the report, highlighted “an issue where many postgraduate researchers perceive a gap in their experience” (p. 27). Therefore, understanding how to foster a sense of belonging may help enhance doctoral candidates’ negative experiences and reduce attrition (Golde, 2005).

These arguments point to the need to understand the nuances of the sense of belonging at the doctoral level – a notable gap that has not been fully addressed by published scoping or systematic reviews. To fill this gap, this paper reviews the existing literature on doctoral students’ sense of belonging and suggests areas for further research. Specifically, we aim to understand how belonging is conceptualised in the doctoral context as well as factors and outcomes associated with doctoral candidates’ sense of belonging. These aims are formulated in three research questions, as discussed in the Methodology session.

Studies of sense of belonging in higher education: a brief overview

In higher education research, belonging is a complex construct (Allen *et al.*, 2024); the definition of belonging varies and can be inconsistent but is often underpinned by a sense of connectedness to peers, staff and the learning environment as well as feeling valued and safe as part of the community where there is diversity and inclusion (Allen *et al.*, 2024). Sense of

belonging is also a multidimensional concept; it may consist of academic, social, personal, physical (Ahn and Davis, 2020), digital (Nieminen and Pesonen, 2022) or spatial dimensions (Wong, 2023).

Studies of sense of belonging in higher education often fall into two schools. The first school includes studies that examine sense of belonging as a psychological construct, often using quantitative methods (e.g. Crawford *et al.*, 2023; Pedler *et al.*, 2022). These studies provide useful insights into the correlates, predictors, associated outcomes and the different survey instruments that can be used. A systematic review of sense of belonging in higher education by Allen and colleagues (2024) reported that outcomes associated with sense of belonging include academic engagement and motivation, student retention, increased institutional and social capital of diverse student populations and academic success and well-being. The determinants of belonging include an institution-wide approach to fostering a sense of belonging, an inclusive environment, effective education practices and quality relationships with educators and peers (Allen *et al.*, 2024).

In contrast, studies in the second school adopt a more critical approach to the sense of belonging. Belonging is not a measurable construct, but rather an experience that is fluid, situated and evolving (Ajjawi *et al.*, 2023; Gravett and Ajjawi, 2022; Yuval-Davis, 2006). These studies challenge the positivist view of belonging as an individualised state to be achieved, highlighting its complex nature and explore how social and structural exclusions play a role in shaping it (Ajjawi *et al.*, 2023; Thomas, 2015), especially for certain groups, such as first-in-family students (O'Shea, 2021), people with disabilities (Nieminen and Pesonen, 2022), LGBTQ+ community (Mann, 2022) or under-represented racial groups (Chang *et al.*, 2014). This literature recognises the importance of having a sense of belonging as well as un-belonging (wanting not to belong) or non-belonging (not being able to belong despite wanting to) as a legitimate part of individual experiences (Ajjawi *et al.*, 2023; Healy, 2020). In doing so, they emphasise how the politics of belonging is inseparable from belonging. As Ajjawi and colleagues (2023) argue, "Belonging involves negotiation of ethical and political values. This is a political act in the sense that belonging can be tied to notions of power, that is, who has the power to define who belongs and how belongingness is conveyed" (p. 4).

This brief overview discusses the major approaches to examining belonging in higher education, highlighting the complexity and nuances of this concept. In the next section, we discuss how the scoping review was conducted.

Methods

The scoping review was conducted using the stages outlined by Arksey and O'Malley's (2005). This review addresses two of the four purposes of scoping reviews suggested by Arksey and O'Malley's (2005). Firstly, it summarises the current empirical, conceptual and review literature on sense of belonging in doctoral education. Secondly, it identifies research gaps in the current literature and suggests pathways for further research in the doctoral education context.

Identifying the research question

The following questions guided our review:

RQ1. How is belonging conceptualised in the studies of doctoral candidates?

RQ2. What are the factors associated with doctoral candidates' sense of belonging?

Identifying relevant studies

We conducted searches in February and March 2024 using the following databases: ProQuest Central, EBSCOhost (Educational Resources Information Centre and Educational Research Complete, Academic Search Complete), Medline, Web of Science, Scopus, PubMed, PsycINFO, Emerald Journals and SAGE. We also searched in the ten major journals in higher education: *Studies in Higher Education* (HE), *Higher Education*, *Assessment and Evaluation in HE*, *HE Research and Development*, *Teaching in HE*, *Journal of Further and HE*, *Journal of Diversity in HE*, *Research in HE*, *Journal of International students*, *The Journal of HE*. Two authors split the databases equally, conducted searches separately and combined the data in Covidence. The searches resulted in 1202 relevant items.

We used the following search strings in the title, abstract and keywords:

(Belonging OR belong) AND ("doctoral education" OR PhD OR graduate research OR postgraduate) AND ("higher education" OR "universit*" OR "tertiary education").*

Due to the lack of consistent conceptualisation of a sense of belonging in higher education, as discussed in previous literature (e.g. [Allen et al., 2024](#)), we decided to include the key terms "belonging" and "belong" as they directly address the research questions. As mentioned in the limitations section, we acknowledge that literature using related concepts, such as academic integration, may have been excluded from this review.

We included publications from 2000 to the time the search was conducted, as we were interested in how studies over the past two decades have informed scholarship in this area. Included literature was published in English; peer-reviewed in a scholarly journal; empirical, conceptual and literature review studies that have belonging as one of the central concepts; focused on the doctoral level or doctoral candidates. In cases where doctoral candidates were included alongside other groups, our decision to include them was based on whether the findings reported for the doctoral candidates were detailed enough for meaningful analysis.

Study selection

After initial searches, duplications were removed before the abstract screening stage. Both authors screened an equal number of articles in the abstract screening stage ($n = 683$) and in the full-text screening stage ($n = 68$) to determine if they qualified for our review. The authors discussed any disagreements in the screening based on the inclusion criteria. After full-text review of the 68 studies, 24 articles were included in the study. A step-by-step process is illustrated in [Figure 1](#).

Extracting the data

Both authors reviewed an equal number of articles ($n = 12$) and extracted information as outlined in [Table 1](#).

Analysing and synthesising results

Both authors reviewed the extracted data in an Excel file and noted relevant insights regarding the three research questions. Three separate Excel files were created for each of the research questions (i.e. conceptualisation, factors, outcomes). Both authors thematically analysed the data and refined the themes through further discussions. Where there was no

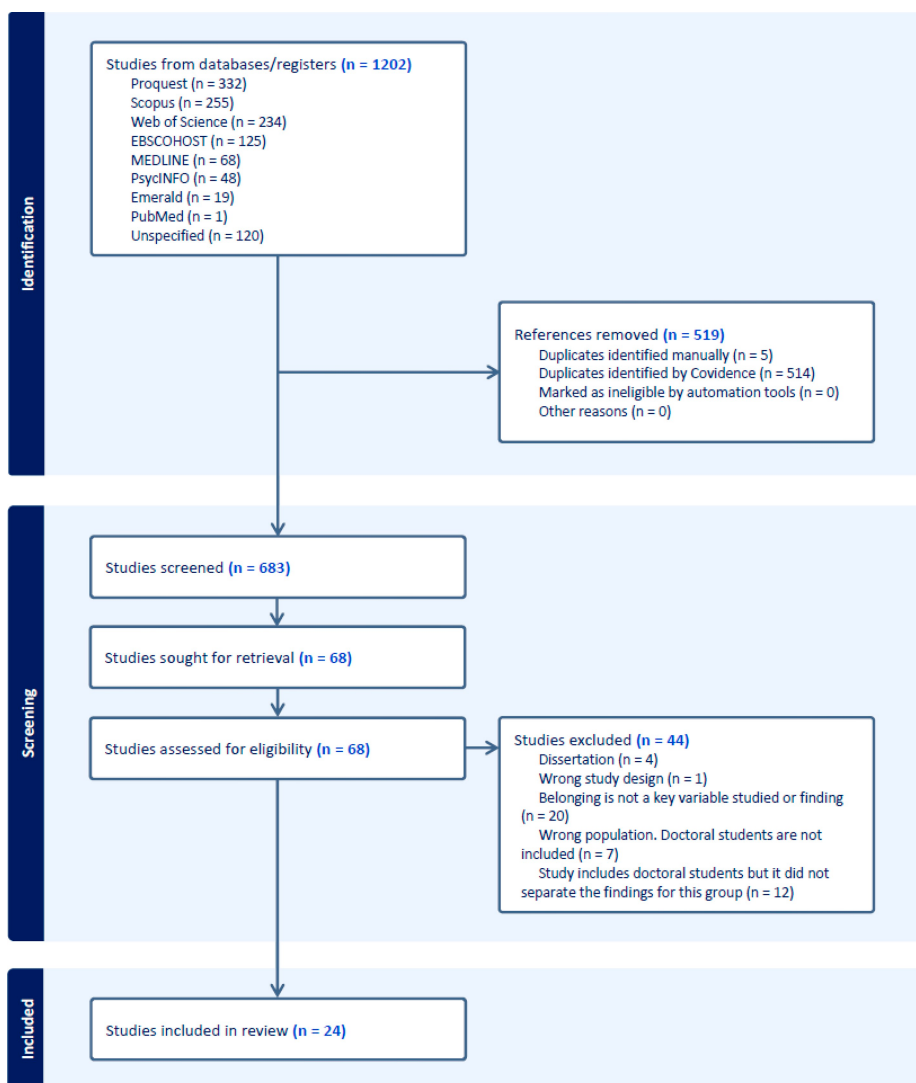


Figure 1. Flowchart of study selection process

Source: Exported from Covidence

clear conceptualisation or definition, the way belonging was measured provided pointers to its conceptualisation.

Overview of the studies

Table 2 provides an overview of the studies by country. It is worth noting that more than half of the research was conducted in the US context.

Table 1. Extracted data for review

Category	Details
General information	• Title • Authors
Conceptual framing of belonging	• Year of publication • Conceptual or theoretical framework • Definition or conceptualisation of belonging
Characteristics of included studies	• References/citations provided • Study aims or research problem • Research questions • Country in which the study was conducted • Methods
Findings	• Study design • Factors influencing doctoral candidates’ sense of belonging • Outcomes or benefits of a sense of belonging • Recommendations or other relevant notes

Source(s): Author’s own work

Table 2. Number of studies by country

Country in which the study was conducted		<i>n</i>
US		14
UK		2
China		1
Europe (<i>n</i> = 3)	Finland	1
	Italy	1
	The Netherlands	1
Oceania (<i>n</i> = 2)	New Zealand	1
	Australia	1
Other (<i>n</i> = 2)	Systematic literature review	1
	Comparative (Canada and UK)	1
Total		24

Source(s): Author’s own work

Table 3 provides an overview of studies by methods. More than half of the studies (*n* = 13) quantitatively measured belonging using a survey research design. Most of the remaining studies (*n* = 9) qualitatively examined belonging using a range of research methods.

A summary of key characteristics of the studies is included in the Appendix. The earliest article in this review was published in 2009, reflecting a rather recent interest in the belonging of the doctoral population. We also note that studies use different terminology to refer to those undertaking a PhD, such as graduate students, doctoral candidates or doctoral students. For consistency, we will use the term “doctoral candidates” in this article, except where a specific term is required.

Table 3. Study by methodsStudies in
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Methodology	Research method	<i>n</i>
Quantitative (<i>n</i> = 13)	Cross-sectional survey	13
Qualitative (<i>n</i> = 9)	Interview study	4
	Autoethnography: diaries and reflective discussions	1
	Combined focus groups and interviews	1
	Qualitative data from a questionnaire	1
	Qualitative data, mixed methods	1
	Weekly logs using a questionnaire	1
Mixed methods (<i>n</i> = 1)	Online survey and focus groups	1
Literature review (<i>n</i> = 1)	Systematic literature review	1
Total		24

Source(s): Author's own work

Findings

Conceptualisation of sense of belonging

Slightly more than half of the articles (*n* = 13) provided a definition of belonging (see [Appendix](#)). Nearly one-third of the articles (*n* = 7) did not define belonging, but how belonging was conceptualised can be inferred from how it was measured. For example, [Ostrove and colleagues \(2011\)](#) measured sense of belonging using three survey items assessing departmental climate: whether it is welcoming or alienating, respectful or disrespectful and down-to-earth or snobbish. The use of these items suggests that belonging can be understood in terms of how a person feels welcomed, respected and valued by their department. The more welcoming, respectful and down-to-earth the climate is, the more belonging someone feels.

Generally, most studies conceptualised belonging as feeling included, valued or a part of a group, an organisation or a system, which is consistent with the broader literature on belonging ([Allen et al., 2021, 2024](#); [Cohen, 2022](#)). In addition, the studies in our review approached sense of belonging from different disciplinary lenses. For example, belonging can be defined from a psychological perspective, “the psychological experience of fit and valued personal involvement in a system” ([Reilly and Fitzpatrick, 2009](#), p. 81) or a sociological perspective, “a felt sense of identifying with and being accepted within a place and/or community, in this instance academia and specific communities within this milieu” ([Morris, 2021](#), p. 132).

The feeling of being part of a larger social environment manifests in diverse connections and relationships within the doctoral learning context. These generally fall into three groups. The first group refers to a sense of belonging to broad, often abstract communities, such as academia, academic culture or the intellectual community ([Antonio and Baek, 2022](#); [Garrett, 2025](#); [Mantai, 2019](#); [McAlpine et al., 2009](#)). This sense of belonging is more abstract, referring to an imagined community of scholars to which a person longs to belong as they navigate their path to becoming a researcher. The second group refers to the sense of belonging to more concrete entity/ies or person(s), often within the local doctoral context, such as campus ([Ma and Ni, 2023](#)), a department or faculty ([Curtin et al., 2013](#); [Ostrove et al., 2011](#)), a research group or a lab ([Jeong et al., 2019](#)), peers in the programme ([Murphy et al., 2023](#); [Stevens et al., 2023](#)) or the doctoral programme ([Grim et al., 2021](#)). The third group refers to the sense of belonging to a country or a new culture, which is often found in studies of international candidates ([Antonio and Baek, 2022](#); [Latif et al., 2020](#)). These conceptualisations demonstrate the multidimensionality of belonging and the variety of ways

it has been operationalised and examined in the studies analysed. They also reflect the different communities or social contexts in which doctoral candidates are part of, including the academic culture, as acknowledged in the existing literature on doctoral education (McAlpine and Amundsen, 2007; White and Nonnamaker, 2008).

Factors associated with sense of belonging

Eighteen studies reported a range of factors associated either negatively or positively with a sense of belonging. These factors are grouped into five themes: academic factors, social connections and experiences, culture, personal factors, physical location and space (Table 4). Note that factors in the same theme can be negatively or positively related to the sense of belonging and differences will be specified where appropriate. Some factors across themes are interrelated, as will be elaborated in the discussion. Note that in this section, we use n to report the number of quantitative studies and n' qualitative studies.

Academic factors

This theme includes factors that fall within the academic domain of doctoral studies. The first sub-theme, *interactions with supervisors*, encompasses both positive and negative interactions and was most frequently mentioned across the studies. Specifically, positive interactions or relationships with supervisors ($n = 1$, $n' = 7$) facilitate a sense of belonging, while negative interactions ($n = 1$) can inhibit it. This factor reflects the importance of the supervision relationship in doctoral candidates' sense of belonging as an additional key dimension in their experiences and success, as widely discussed in the literature (e.g. Sverdlik et al., 2018).

The second sub-theme is *academic support and opportunities for academic engagement and development* ($n = 3$). Factors in this sub-theme can be viewed from two angles: what the institution offers and the candidate's engagement with these offerings. For example, encouragement and support provided by the faculty for conference attendance were reported to foster a sense of belonging (Morris, 2021). Conversely, the candidate's engagement in a range of scholarly or academic events, such as attending academic workshops or presenting at a conference, contributes to the feeling like an academic and therefore belonging to an academic community (McAlpine et al., 2009). In contrast, the lack of opportunities to participate or rejection to be involved in scholarly communities by academics at the faculty was a source of disengagement and a lack of a sense of belonging (Vekkaila et al., 2014).

The final sub-theme is *academic achievement and progress* ($n' = 1$), which has one factor reported in a study of international doctoral candidates in the US by Antonio and Baek (2022). Their participants reported a strong desire for academic competency, emphasising academic indicators such as GPA, passing qualifying exams and research progress as contributing to their sense of belonging. The authors suggested that academic achievement was important to international candidates' sense of belonging due to the meritocratic culture of the institution as well as "their struggle to obtain a sense of belonging within non-academic contexts" (p. 138), suggesting the different dimensions of sense of belonging in doctoral education and the complexities of belonging across students from different backgrounds.

Social connections and experiences

Factors in this theme refer to a range of social interactions, often outside of the supervision relationship included in the first theme. The first sub-theme is *interactions with peers* ($n = 1$, $n' = 4$), suggesting that positive interactions with peers can facilitate a sense of being a valued member of the faculty (McAlpine et al., 2009; Vekkaila et al., 2014). In addition, in

Table 4. Factors associated with sense of belonging for doctoral candidates

Theme	Sub-theme	Factors	Citation
Academic factors	Interactions with supervisors	Positive interactions with supervisors	McAlpine <i>et al.</i> , 2009; Curtin <i>et al.</i> , 2013; Vekkaila <i>et al.</i> , 2014; Jeong <i>et al.</i> , 2019; Morris, 2021; Antonio and Baek, 2022; Ma and Ni, 2023; Cropps, 2023
	Academic support and opportunities for academic engagement and development	Negative interactions with supervisors	Vekkaila <i>et al.</i> , 2014
		Academic support	McAlpine <i>et al.</i> , 2009; Vekkaila <i>et al.</i> , 2014; Cornwall <i>et al.</i> , 2019
		Participation in workshops and skills tutorials	McAlpine <i>et al.</i> , 2009; Vekkaila <i>et al.</i> , 2014; Cornwall <i>et al.</i> , 2019
Social connections and experiences	Academic achievement and progress	Lack of opportunities to participate in scholarly communities	Vekkaila <i>et al.</i> , 2014
		Academic achievement or progress	Antonio and Baek, 2022
		Positive interactions with peers	McAlpine <i>et al.</i> , 2009; Vekkaila <i>et al.</i> , 2014; Jeong <i>et al.</i> , 2019; Ma and Ni, 2023
	Interactions with other staff at the department	Peer support initiatives	Cornwall <i>et al.</i> , 2019
Culture	Social experiences	Positive interactions with staff at the department	Vekkaila <i>et al.</i> , 2014; Morris, 2021; Antonio and Baek, 2022; Cropps, 2023
		Negative interactions with staff at the department	Vekkaila <i>et al.</i> , 2014
		Negative social experiences	Vekkaila <i>et al.</i> , 2014; Cornwall <i>et al.</i> , 2019; Morris, 2021; Cropps, 2023
	Culture of the academy	PhD and academic culture	Morris, 2021
	Culture of the department	Social exclusion, isolation, lack of social support or negative departmental climate	Vekkaila <i>et al.</i> , 2014; Cornwall <i>et al.</i> , 2019; Tommasi <i>et al.</i> , 2022; Cropps, 2023; Stevens <i>et al.</i> , 2023
		Diversity of international candidates	Antonio and Baek, 2022
		Micro-aggressions, discrimination, stereotypes	Morris, 2021; Cropps, 2023; Murphy <i>et al.</i> , 2023
			(continued)

Table 4. Continued

Theme	Sub-theme	Factors	Citation
Personal factors	Demographic factors	Demographic factors	Morris, 2021; Sherman <i>et al.</i> 2021; Antonio and Baek, 2022
	Academic interests, values and goals	Academic interests and goals Concerns about academic attitudes and values	Sherman <i>et al.</i> , 2021 Stevens <i>et al.</i> , 2023
		Alignment of values with the programme's work Identification as a researcher	Miller and Orsillo, 2022
Physical location and space	Financial factors	Financial factors	Stevens <i>et al.</i> , 2023
	Stress	Stress	Ostrove <i>et al.</i> , 2011
	Campus presence Physical workspace	Campus presence Lack of physical workspaces	Reilly and Fitzpatrick, 2009 Cornwall <i>et al.</i> , 2019; Ma and Ni, 2023 Morris, 2021
Source(s): Author's own work			

the US context, [Jeong and colleagues \(2019\)](#) found that those who interacted with their peers “in a more inclusive way were significantly more likely [...] to feel assured of their belonging to the research group” (p. 9).

It is worth noting that having positive interactions with peers can also be academically beneficial. This factor, however, is placed in the second theme because the literature tends to assign academic value to interactions with supervisors and non-academic value to other interactions. In reality, it is not often possible to make this distinction, as interaction with peers can also be an academic learning experience ([Boud and Lee, 2005](#)). This example highlights the interrelatedness of factors that contribute to a sense of belonging.

The second sub-theme is *interactions with other staff within the faculty or department* ($n' = 5$). For example, in a UK study, [Morris \(2021\)](#) noted that feeling welcomed by administrative staff can make candidates feel valued and part of the department or faculty. In contrast, negative experiences, such as rejection from being involved in the department’s scholarly communities ([Vekkaila et al., 2014](#)), can make them feel socially isolated and diminish their sense of belonging.

The third sub-theme is *social experiences* ($n' = 4$). In particular, negative social experiences occurring in the department, such as not feeling welcomed or being made to feel isolated, shape a person’s sense of belonging ([Cornwall et al., 2019](#); [Cropps, 2023](#)). The lack of belonging also occurs when a candidate feels unaccommodated by the workspace, unwelcomed by staff, unable to form social connections with peers or supervisors or a lack of integration into the department’s research community ([Morris, 2021](#)). Generally, interactions with peers or staff at the department are concrete instances that contribute to a person’s social experiences. Social experiences may also be influenced by the lack of interactions and, relatedly, social isolation and detachment from the departmental community ([Cornwall et al., 2019](#)).

Overall, social interactions and experiences foster the feeling of recognition and validation associated with a sense of belonging. In contrast, feeling unfit or inadequately recognised, supported or connected can hinder a sense of belonging and becoming a researcher ([Cropps, 2023](#); [Mantai, 2019](#)).

Culture

Factors in this theme refer to the candidate’s academic habitus or departmental culture. The first sub-theme is *culture of academia* ($n' = 1$), as reported by [Morris’ \(2021\)](#). The author used the metaphor “peering through the window looking in” to depict doctoral candidates’ intimidating and isolating feelings about the culture of the UK academy, characterised by a lack of diversity, elitism, high pressure and overwork. These feelings were further reinforced by the “in-between” status of not being a student and not yet an academic. Morris noted that “constructions of PhDs in particular as solitary individualised journeys can inhibit belonging” (p. 140).

The *culture of the department or faculty* is the second sub-theme. Specifically, a welcoming, strong departmental community can make someone feel supported, while infighting within the department and a lack of academic activities for intellectual stimulation are associated with stress and detachment ([Cornwall et al., 2019](#); [Vekkaila et al., 2014](#)). Similarly, a lack of social support or a positive relationship with others in the department can negatively affect the sense of belonging ([Stevens et al., 2023](#); [Tommasi et al., 2022](#)). The diversity of the doctoral cohort within the department also plays a role. In the US context, [Antonio and Baek \(2022\)](#) reported that diversity of nationalities within the doctoral cohort can both foster a sense of belonging (people can connect with others of the same nationality) and inhibit it (people connect only with those of the same nationality). In addition, for

candidates from minority backgrounds, such as Black women (Cropps, 2023) or low-income candidates (Murphy *et al.*, 2023), may experience micro-aggression or discrimination that hinders their sense of belonging. As noted earlier, factors in this group may be interrelated with the social experience factors because culture forms the implicit foundation for social interactions (or lack thereof) and the nature of these interactions.

Personal factors

Factors in this theme refer to the personal realm of the candidate. The first sub-theme refers to *demographic characteristics* ($n = 1$; $n' = 2$), such as social class, gender and international or domestic candidacy. Studies suggested that candidates from certain backgrounds felt less of a sense of belonging due to the perceived elitist culture of academia. Murphy and colleagues (2023) reported that US doctoral students from low-income, economically marginalised backgrounds who experienced classism during their candidature felt less belonging, reported more dissatisfaction with their programmes and had a greater intention to discontinue their doctoral studies. However, also in the US, Zhou and Mollo (2023) found no significant difference between parenting and non-parenting doctoral candidates in terms of school belonging and other academic outcomes, such as persistence.

There are some findings related to international doctoral candidates. Mantai's (2019) study in the Australian context reported that a change in status – i.e. being an early-career researcher in a different country and a PhD “student” in Australia – could disrupt someone's sense of belonging to academia. Curtin and colleagues (2013) found that international candidates had a stronger sense of belonging to their department compared to their domestic counterparts in the US. Antonio and Baek (2022) reported that international candidates placed more importance on academic belonging (e.g. academic achievement) than on social belonging (e.g. social connections) in a US study. They hypothesised that international candidates place greater emphasis on academic belonging to compensate for a lack of social belonging.

The *academic interests, values and goals* ($n = 4$) sub-theme refers to whether an individual's interests, values or goals align with academia or their research programmes. Stevens and colleagues (2023) reported that doctoral students in the US who had positive attitudes towards academic identity and graduate school felt more belonging to their programmes. In contrast, those who had the most negative attitudes towards graduate school and the most negative interpersonal relations had the worst fit and the lowest self-esteem, self-efficacy and sense of belonging.

The *financial factors* ($n = 1$) sub-theme refers to financial struggles or a lack of financial support. In the US context, Ostrove and colleagues (2011) found that candidates from poor and working-class backgrounds were more likely to experience financial struggle, which is associated with feeling less belonging.

Finally, using a sample of doctoral students in a US university, Reilly and Fitzpatrick (2009) reported that *stress*, measured by the degree to which an individual perceives their life as unpredictable, uncontrollable and overloading, is negatively related to the sense of belonging. Specifically, the more stressed someone feels, the less belonged to the programme they feel.

Physical location and space

Factors in this theme refer to the geographical location and physical workplace of the doctoral candidate. The lack of *campus presence* ($n = 1$) or the inability to study physically on campus is associated with a lack of opportunities to foster social experiences, as discussed in the previous theme. In a study at a university in New Zealand, Cornwall and colleagues

(2019) reported that distance candidates “felt a detachment from the academic community because they did not get the “stimulation from discussion with members of my department” (p. 369).

The second factor is *physical workspace* ($n=1$), referring to whether a candidate is accommodated with a proper workplace on campus. In the UK, Morris’ (2021) study found that the lack of a designated workspace poses “a significant barrier to progression alongside affecting belonging and wellbeing” (p. 135). Morris’ study also showed that having an appropriate workspace is as practical as much as it is symbolic – its non-existence reinforces the difference in identity and status between the candidate and other academics.

Outcomes associated with sense of belonging

Six outcomes related to the sense of belonging were identified in seven studies. Table 5 provides a summary and relevant citations.

Mental health and wellbeing are the most frequently mentioned outcomes in the review ($n=2$, $n' = 2$). For example, Jones-White and colleagues (2022) reported that doctoral students in the US with higher levels of belonging were significantly less likely to experience major depressive disorder symptoms (61.7% reduction in the odds of having) and generalised anxiety disorder symptoms (56.2% reduction in the odds of having). In addition, Morris (2021) showed that feeling welcome or being accommodated with a workspace enhances a sense of belonging and, as a result, positively impacts wellbeing.

Sense of belonging is also found to be associated with improved *academic self-concept, skills or abilities* ($n=1$), *engagement with PhD studies* ($n' = 2$) and *satisfaction with PhD studies* ($n=1$, $n' = 1$). Ostrove and colleagues (2011) reported that a lower sense of belonging is associated with lower academic self-concept and lower interest in pursuing a career as a professor at a top US research university. Vekkaila and colleagues (2014) in the Finnish context and Morris (2021) in the UK context found that a sense of belonging to scholarly or departmental communities is important for individual engagement in development as a researcher. They also reported that a candidate’s belonging to and their engagement in the scholarly community contributed to a positive experience and satisfaction with their studies. Another outcome of sense of belonging is *course retention* ($n=1$), as van Rooij and colleagues (2021) found that sense of belonging is negatively related to the candidate’s intention to quit their studies in a Dutch university. Finally, Grim and colleagues (2021) reported that a sense of belonging can predict *teaching career aspirations* ($n=1$) for doctoral students in the US.

Table 5. Outcomes associated with sense of belonging in doctoral studies

Outcome	Citation
Mental health and wellbeing	Vekkaila <i>et al.</i> , 2014; Morris, 2021; Jones-White <i>et al.</i> , 2022; Tommasi <i>et al.</i> , 2022
Academic self-concept, skills or abilities	Ostrove <i>et al.</i> , 2011
Engagement with PhD studies	Vekkaila <i>et al.</i> , 2014; Morris, 2021
Satisfaction with PhD studies	Vekkaila <i>et al.</i> , 2014; van Rooij <i>et al.</i> , 2021
Course retention	van Rooij <i>et al.</i> , 2021
Teaching career aspirations	Grim <i>et al.</i> , 2021
Source(s): Author’s own work	

Discussion

Our review shows that the conceptualisation of sense of belonging in doctoral education generally reflects existing higher education literature, referring to feeling connected, valued, respected or included (Allen *et al.*, 2024; Strayhorn, 2018). The sense of belonging is positioned in relation to academia, the intellectual community or the faculty or the local research lab, reflecting the particularity of the doctoral context and research work. However, the current conceptualisation of belonging remains limited and often implicit. The two schools of study are also reflected in the review, with some articles approaching it to measure while others to critique. Specifically, some articles conceptualised belonging as “fitting in” and measured it through the extent to which a person feels “belonged” to these groups (e.g. Curtin *et al.*, 2013; Jeong *et al.*, 2019; Naidoo *et al.*, 2023). However, as Nieminen and Pesonen (2022) argue, this “technico-scientific standpoint sees belonging as a construct that can be measured, fostered and controlled” (p. 2022). In other words, this approach does not challenge the academic establishment and its current practices nor engage with the political aspect of belonging that is tied to “who has the power to define who belongs and how belongingness is conveyed” (Ajjawi *et al.*, 2023, p. 4). In contrast, other articles used belonging as a concept to critique how academic practices and habitus – often perceived as elitist – tend to exclude or alienate people from certain groups (Garrett, 2025; Miller and Orsillo, 2022; Morris, 2021; Murphy *et al.*, 2023). In this sense, these studies engage in the politics of belonging by highlighting the candidate’s unbelonging: their struggle to belong despite having gained membership to academia (Ajjawi *et al.*, 2023).

The five themes of factors associated with sense of belonging indicate that the sense of belonging is multidimensional, as existing literature has shown (Ahn and Davis, 2020; Allen *et al.*, 2024). This multidimensionality means there are different venues where a sense of belonging can be fostered or inhibited as doctoral candidates navigate through the personal, physical and cultural spaces. In addition, factors within these themes are interrelated and overlapping; the distinction between them is sometimes not straightforward. For example, interactions with a supervisor are categorised under the academic factors. However, in reality, they can be part of the social interactions depending on the occasion and purpose of the interaction. Similarly, interactions with peers and other academics in the department are categorised as social interactions but can also contribute to the academic affairs of candidates. Another example is the culture of the department, which can shape interactions among candidates and others in the department, as well as their overall social experience. This multidimensionality highlights the complexity in understanding a sense of belonging in doctoral education and the need for specific conceptualisation when researching the topic or measuring belonging in practice.

When comparing these themes with Ahn and Davis’ (2020) four domains of belonging in undergraduate students, some similarities and differences can be delineated. In the *academic domain*, the focus of the undergraduate population is on curriculum, university and lecturers; in the doctoral context, it is about interactions with supervisors. In the *social domain*, undergraduate students’ interaction circles can extend beyond the study context (e.g. pubs, societies). For doctoral candidates, social interactions that matter to their sense of belonging seem to revolve around the local research context, such as the department, programme or lab. Ahn and Davis’ *surroundings domain* refers to the living space and geographical and cultural locations. These are not significant in our review; instead, physical workspace (whether the candidate has a proper, designated workplace) and campus presence (whether the candidate is based on campus) are related to their sense of belonging, although these dimensions are less frequent in the articles reviewed. These findings echo existing literature in highlighting the importance of physical space on campus to developing researcher identity, probably due

to the intellectual demand of doing a PhD that requires stability of a workplace (Dowling and Mantai, 2017). Digital space (e.g. digital learning environments) may also have an impact on the sense of belonging (Nieminen and Pesonen, 2022). However, this factor was not present in our review and deserves further attention, given the use of digital tools and environments, especially for those who are not on campus (McChesney *et al.*, 2024) and in the current post-pandemic context, where working from home has increased. In the *personal space*, factors identified by the review are similar to those identified by Ahn and Davis. Our analysis identified a culture theme that may be specific to the doctoral context, emphasising the role of departmental culture or academic habitus in shaping doctoral candidates' sense of belonging. This finding echoes existing literature that has identified departmental culture as critical in supporting their mental health and wellbeing (Ryan *et al.*, 2022). This is in contrast with the undergraduate level, where belonging is often discussed in relation to the university or institution (Ahn and Davis, 2020; Kahu *et al.*, 2022). Further research on doctoral education might explore the "culture" dimension of sense of belonging among doctoral candidates and the implications for their experiences.

Although less discussed in the studies analysed, the outcomes associated with a sense of belonging for doctoral candidates are generally positive, reflecting the broader higher education literature on belonging, such as academic engagement and motivation, student retention and wellbeing (Allen *et al.*, 2024). In the doctoral context, the outcomes are framed in terms of individuals' engagement and satisfaction with their PhD studies, their development as a researcher and their interest in pursuing an academic career. Most importantly, the review highlights the relevance of a sense of belonging to candidates' mental health and wellbeing, as frequently reported in the studies. This finding highlights an area for further research in understanding the connection between a sense of belonging and wellbeing among doctoral candidates. A less discussed outcome among the studies reviewed was doctoral attrition or persistence; only one study examined this variable. Considering the importance of doctoral attrition in doctoral education, further research is needed to explore sense of belonging and doctoral attrition and the factors influencing this connection. It may be that key factors, such as positive interactions with supervisors and peers, encourage students' sense of belonging and their intentions to continue in the programme, as suggested in undergraduate courses.

What seems to be lacking in the literature is how doctoral candidates' contributions to the department or scholarly communities can shape their sense of belonging. In a book on belonging, Geoffrey Cohen defines belonging as "the feeling that we're part of a larger group that values, respects and cares for us – *and to which we feel we have something to contribute*" (Cohen, 2022, p. 5, emphasis added). This definition emphasises the two-way relationship between the individual and the group that they long to belong to: belonging is fostered when a person is valued, respected and cared for as well as when they have the ability and opportunities to contribute. This understanding echoes McMillan and Chavis's (1986) criteria that make up the sense of community, one of which is influence: "a sense of mattering, of making a difference to a group and of the group mattering to its members" (p. 9). Yet, this second part seems to be missing from most definitions of belonging and from the empirical research included in the review. Thus, an avenue for future research is to explore how doctoral candidates, who are expected to be self-directed and independent, can contribute to the research culture within the department or scholarly communities and the impact it has on their sense of belonging.

Limitations

The first major limitation comes from our approach to identifying articles for the review. The review only included articles published in English over the past two decades and indexed in

major search databases. This means there might be relevant literature on this topic that was excluded by these criteria. Secondly, our search terms did not include concepts that may be related to belonging, such as social integration, connectedness, relatedness or engagement (Allen *et al.*, 2024). Inclusion of these may result in additional relevant articles. While including studies from different contexts adds complexity in understanding sense of belonging, we do acknowledge the contextual differences between doctoral programmes globally that may influence the findings of this study.

Conclusion

By reviewing literature on sense of belonging at the doctoral level, this study offers a nuanced understanding of this concept for future research and practices. Based on a small number of studies, our review indicates that the literature on this topic remains nascent and conceptually fragmented. The limited and often implicit conceptualisation of belonging warrants further conceptual work. In the context where mental health and well-being are major concern for doctoral candidates (Levecque *et al.*, 2017), the positive impact that belonging has on mental health and well-being highlights a need to understand and cultivate a sense of belonging among this cohort. In addition, insights from the factors associated with belonging can inform institutions and staff working with doctoral candidates in designing meaningful opportunities to foster a sense of belonging while acknowledging and accommodating their backgrounds and situations. Finally, acknowledging the multidimensionality of the concept of belonging means there is no one-size-fits-all approach to it; fostering it requires thoughtful consideration of the personal, social, physical and cultural aspects, both individually and collectively, in the doctoral context.

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Table A1. Summary of studies included in the review

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Reilly and Fitzpatrick, 2009 US	“the psychological experience of fit and valued personal involvement in a system”	To examine the relationship between perceived stress and sense of belonging	Quantitative, survey	89 Doctor of nursing practice students	4-point Likert scale using the Sense of Belonging Instrument-Psychological (SOBI-P) subscale items
McAlpine et al., 2009 Canada and UK	Not provided	To explore events or activities contributing to the feeling of being an academic or belonging to an academic community	Qualitative, weekly logs using a questionnaire.	23 PhD candidates in social science disciplines from 2 institutions in Canada and the UK	N/A
Ostrove et al., 2011 US	See measurement	To examine the extent to which graduate students’ social class backgrounds structure a sense of belonging in graduate school and the relation between that sense of belonging and graduate students’ academic self-concept	Quantitative, survey	859 PhD candidates who had completed at least One year	5-point Likert scale on 3 items on the departmental climate Welcoming climate (welcoming-alienating), Respectful climate (Respectful-disrespectful) and Down-to-earth climate (down-to-earth-snobbish)
Curtin et al., 2013 US	See measurement	To examine advisor support, sense of belonging and academic self-concept among international and domestic doctoral students	Quantitative, survey	841 PhD candidates who had completed at least One year	5-point Likert scale on 3 items on the departmental climate Welcoming climate (welcoming-alienating), Respectful climate (Respectful-disrespectful) and Down-to-earth climate (down-to-earth-snobbish)

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Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Vekkai <i>et al.</i> , 2014 Finland	Not provided. Belonging was One of the Four categories inductively coded from interview data as sources of engagement and disengagement	To understand doctoral students' engagement in and disengagement from their doctoral work	Qualitative, interview study	16 PhD candidates whose doctoral processes had been prolonged for more than Seven years	N/A
Mantai, 2019 Australia	Belonging is conceptualised "a consequence of social and collaborative practices that lead to co-constructed identities"	To investigate the nature and role of social support in the PhD, particularly in the development as a researcher	Qualitative, combined focus groups and interviews	64 PhD candidates in STEM and HASS from Two Australian metropolitan universities	N/A
Cornwall <i>et al.</i> , 2019 New Zealand	Not provided	To identify aspects of the early stages of doctoral study that students appraised as stressful	Qualitative, other: Qualitative data from a questionnaire	352 First-year PhD students at the University of Otago	N/A
Jeong <i>et al.</i> , 2019 US	See measurement	To identify doctoral student-faculty and peer interaction patterns and connect these profiles to a wide range of affective and cognitive doctoral outcomes	Quantitative, survey	336 PhD students in lab-based biology	11-point Likert scale using Three items in the Perceived Cohesion Scale, adapted to research group/lab
Latif <i>et al.</i> , 2020 N/A	"the experience of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment. It includes being valued, needed and accepted by various groups"	To identify factors that can improve the cultural and academic experiences of east Asian PhD students attending Australian universities	Other, systematic literature review	N/A	N/A

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Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Rooij <i>et al.</i> , 2021 Netherlands	A sense of connectedness and the belief that One is important and matters to others in an organisation	To investigate how supervision factors, psychosocial factors and project characteristics are related to doctoral success	Quantitative, survey	839 PhD candidates from diverse disciplines and years of study at One Dutch university	5-point Likert scale using 6 items adapted from a study for undergraduates
Grim <i>et al.</i> , 2021 US	“the integration of oneself among the social contexts”, sense of belonging measured as personal socialisation “how One’s identity is integrated in the doctoral work context”	To understand the socialization factors that contribute to the aspirations of doctoral students of colour to pursue teaching careers	Quantitative, survey	2717 PhD candidates of Colour from over 221 US institutions, who indicated teaching as their primary or secondary goal	By responding to the question “how much do you feel you belong to your programme?” (“not at all,” “some,” and “a lot.”)
Morris, 2021 UK	“a felt sense of identifying with and being accepted within a place and/or community, in this instance academia and specific communities within this milieu.”	To explore belonging in relation to postgraduate subjective wellbeing and identify ways in which this is intertwined with a sense of belonging	Qualitative, interview and written reflections	53 PhD candidates, Doctor of Education and taught postgraduate students ($n = 11$)	N/A
Sherman <i>et al.</i> , 2021 US	The extent to which people feel as though they are liked and accepted within a particular context	To investigate potential gaps in career preferences and expectations between graduate students and advisors in STEM fields and the implications of possible discrepancies in normative perceptions	Quantitative, survey	195 PhD candidates in STEM at Two universities	7-point Likert scale using 11 items adapted from the Belonging Scale, adapted to department level

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Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Tommasi et al., 2022 Italy	“a sense of being part of something larger than the self”	To understand the factors underpinning mental illness symptoms and quit intention among doctoral students	Quantitative, survey	204 PhD candidates from Seven Italian universities	7-point Likert scale using 3-item Belonging feature in the Meaningful Work Inventory, adapted to the research group level
Miller and Orsillo, 2022 US	“feeling that One is valued, needed, accepted and that One fits in a particular system or environment”	To examine the importance of intrinsic, extrinsic and altruistic career values and affordances during graduate study on psychosocial functioning, sense of belongingness and satisfaction with One’s doctoral study experience	Quantitative, survey	436 PhD candidates who self-identified from an underrepresented racial minority group, in their first, second and third year from a range of disciplines	6-point Likert scale using items adapted from the Campus Connectedness Scale rated from a Six-point Likert scale
Antonio and Baek, 2022 US	“an individual’s perception on whether he or she feels qualified, included or connected in the institution”. “One’s sense of belonging for international students, may be interpreted in terms of cultural acceptance or identification, social belonging and integration into a community or academic membership into a selective intellectual community”	To explore students’ understanding of their belonging beyond the surface of survey measures	Qualitative, interview study	12 International male PhD candidates in electrical engineering	N/A

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Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Jones- White <i>et al.</i> , 2022 US	See measurement	To examine whether programme climate factors, stressors, demographic and institutional variables are associated with doctoral students' clinically significant generalized anxiety disorder and major depressive disorder symptoms	Quantitative, survey	2582 PhD candidates from 25 disciplines from Five universities	4-point Likert scale using the belonging item in the gradSERU Survey, adapted to the programme level
Naidoo <i>et al.</i> , 2023 US	Someone feels a sense of belonging when they are (a) secure, accepted, included, valued and respected by a defined group, (b) connected with or integral to the group and (c) that their professional and/or personal values are in harmony with those of the group	To explore how students in an online doctor of education programme experience becoming academic writers and trends in students' belonging and writing self- efficacy	Other, online survey and focus groups	74 (survey), 11 (interviews) PhD candidates in an online Doctor of Education programme	7-point Likert scale on selected items in the Belonging Uncertainty Scale and the Sense of Social and Academic Fit Scale. Both were adapted to measure belonging at the programme level
Zhou and Mollo, 2023 US	See measurement	To describe the demographic characteristics and the socioemotional well-being of parenting doctoral students enrolled in US higher institutions	Quantitative, survey	6098 PhD candidates from diverse backgrounds	6-point Likert scale using One item ("I see myself as a part of the campus community") from the Perceived Cohesion Scale (<i>continued</i>)

Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Ma and Ni, 2023 China	“the psychological sense of being a member who is cared for, valued by and connected to the university community, a sense that students commonly develop through campus involvement” Not provided	To examine the challenges and opportunities that COVID-19 has brought to the identity development of offshore doctoral students	Quantitative, autoethnography: diaries and reflective discussions	2 Offshore, full-time PhD candidates	N/A
Cropps, 2023 US		To examine how intersecting oppressed identities shape the socialization experiences of black women doctoral candidates in agricultural disciplines at historically white institutions	Qualitative, interview study	5 PhD candidates who self-identified as Black women in agricultural disciplines	N/A
Murphy et al., 2023 US	See measurement	To test the relations among interpersonal classism, status-based identity uncertainty, belonging and academic outcomes in a sample of US doctoral students from low-income and economically marginalised backgrounds	Quantitative, survey	102 Domestic PhD candidates	7-point Likert scale using 12 items from the General Belongingness Scale, adapted to the doctoral programme level

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Table A1. Continued

First author (year), country	Definition or conceptualisation of belonging	Study aim	Research design, method(s)	Study sample	Measurement of belonging
Stevens <i>et al.</i>, 2023 US	See measurement	To examine the psychological profiles of different types of doctoral students commencing their programmes to identify those who may be at risk of attrition	Quantitative, survey	1081 First-year PhD candidates in STEM from Three universities	7-point Likert scale using 9 items from the Social and Academic Fit Scale and 3 items from the Belonging uncertainty scale, adapted to the school level
Garrett, 2025 UK	Belonging is a dynamic and fluid process that is shaped by various intersecting factors. There is an emphasis on the role of boundaries in defining who belongs and who does not, which can shift depending on people's social locations and shape how people are valued and judged	To interrogate institutional whiteness in UK higher education through the counter-stories of "mixed race" women navigating PhDs	Qualitative, interview study	5 PhD mixed race women candidates in UK institutions	N/A